

MARINE REVIEW.

VOL. XIII.

CLEVELAND, O., MARCH 5, 1896.

No. 10.

Lake Freight Matters.

Prices of ore for 1896 have not as yet been fixed by the ore dealers, but it would not be surprising if the association of sales agents should make an announcement within a week or ten days. The condition of the iron market is certainly not as favorable as it was shortly after the close of navigation last fall to an advance of \$1 or more over last years prices, and on this account the announcement of prices, if it should come shortly, will be highly interesting. The furnace interests are now certain of holding out longer than was expected on cheap ores of last year, and the situation as regards both ore dealers and vessel owners is not as encouraging as it was during the early part of the winter. Vessel owners are not, however, urging the matter of contracts, and there still seems to be a strong disposition among them to hold out for better than \$1 from the head of Lake Superior. All talk about Marquette contracts, recently, has been based on an offer from one ore shipping firm to close up a block of ore from Marquette at 90 cents, the vessels to run as late as one trip in November. The offer was not accepted, and even the managers of the ore firm concerned say that they are pleased that it was not accepted, as it might have a bad effect on prices of ore.

Proposed Changes in Steamboat Inspection Service.

Senator Wm. P. Frye, chairman of the senate committee on commerce and a leader in all matters pertaining to marine legislation, has introduced in the senate a bill (No. 2,162) which proposes a reorganization of the steamboat inspection service. In a letter to the REVIEW regarding this measure, Mr. Frye says:

"My attention was called especially to the steamboat inspection service by several articles in the New York Herald a year ago, making serious charges. I made some investigation of the matter and arrived at the conclusion that there was a good deal more smoke than fire; that the cause of complaint, if any, arose from the fact that these inspectors were made political appointees. Several other matters occurred to me wherein improvements might be made in the law. I had an interview with Gen. Dumont and called his attention to the necessity of having a careful revision of the law and several amendments, and asked him if he would, before the next session of congress, go over the whole thing with care, inserting the amendments which I proposed, and also repealing sections of statutes which were obsolete, and make any provisions which he thought would improve the service. This bill is the result of that investigation. I have submitted it to a sub-committee for careful examination."

We have not found time to go over the bill fully and note all changes which it proposes, but it is understood that the measure is not of a radical kind. It increases the salary of the supervising inspector-general to \$4,500 a year and provides for an assistant to that official at a salary of \$2,500 a year. It also provides that of the ten supervising inspectors five shall be licensed masters and five chief engineers. The assistant inspector is to be an engineer. In a future issue we hope to give a concise account of the principal changes which the bill proposes.

Depth of Lake Superior Mines—Low Mining Costs.

John Birkinbine, engineer, of Philadelphia, who is well known as a statistician and expert in mining matters, has made numerous visits to the lakes and to the mining region of Lake Superior. Of late he has delivered several interesting lectures before the Engineers' Club of Philadelphia on notable engineering achievements in this part of the country. Mr. Birkinbine's talks to the Philadelphia engineers are, of course, given up to matters that are not new to the readers of the REVIEW, such as information regarding to methods involved in mining and shipping iron ore, short descriptions of river and harbor projects, etc., but he has the faculty of stating these things in a very interesting way, as indicated by abstracts from the proceedings of the Philadelphia club which we have received. In the course of one of these lectures recently he said:

"As illustrating the depths reached by some of the mining operations of Lake Superior and the relations which the mouth and bottom of various shafts bear to the level of the ocean and that of Lake Superior, it may be stated that in the copper region the work has been carried to a depth of nearly one mile from the surface, and those interested in these exploitations anticipate no unsurmountable difficulties in reaching depths of 10,000 feet. The surface at these mines approximates 650 feet above Lake Superior, or 1,250 feet above sea level, but the vertical shafts of the Tamarack and Calumet and Hecla, the slopes of the Quincy and other

mines, extend far below the water level of Lake Superior and of the ocean, and the Silver Islet workings were carried from a few feet above the lake level to below ocean level.

"The iron mines are located from 550 to 1,200 feet above lake level, and although a number have been exploited to or below lake level, but a few have been carried to depths below ocean level. The high temperatures experienced in the Comstock lode and other deep workings in the western states is not apparent in the Lake Superior mines, which have penetrated the earth for great distances. The increase in temperature is not great, and at 1,500 feet the mine water becomes saline, but as greater depths are reached more objectionable characteristics are noticed, the water becoming so acrid as to destroy books and clothing and affect the skin.

"In some of the iron ore mines ore is dug from 500 to 700 feet below the surface and delivered on cars for shipment for less than 70 cents per ton. This includes wages of miners, cost of light, explosives, timbering, etc., surface and machinery attendance, repairs and all charges except royalty, general administration, and interest on investment. During the business depression which has characterized the past two years, millions of tons of iron ore have been mined in the Lake Superior region, shipped by railroad from 15 to 90 miles to ore docks, transferred to vessels, and carried from 600 to 1,000 miles, unloaded and delivered on cars at lower lake ports for from \$2.00 to \$3.00 per ton. Although little if any profit (after paying royalties or interest) resulted from these low prices, the possibility of accomplishing the above result is a tribute to the skill in mining, transporting and handling large quantities of ore."

Men Who Compile the Inland Lloyd's Register.

A supplement accompanying this issue of REVIEW presents, in a group, likenesses of the representatives of general insurance agencies on the lakes; men who look after wrecks, the classification of ships, etc., and who were engaged in Cleveland recently compiling the Inland Lloyd's Vessel Register for 1896. They are all practical vessel masters, who have a knowledge also of ship construction. Some of them sailed ships in the fifties, and a short summary of their connection with lake shipping will make interesting reading. Such a summary will be printed in the next issue of the REVIEW. The group includes, Capt Daniel McLeod, Cleveland, who is in charge of the publication of the register; Capt. J. V. Tuttle of Milwaukee, representing the Mannheim company; Capt. Charles Davis, representing D. Vance & Co., Milwaukee; Capt. Cyrus Sinclair, representing C. A. Macdonald & Co., and Earle & Massey of Chicago; Capt A. L. Fitch, representing C. W. Elphicke & Co. and Geo. L. McCurdy of Chicago; Capt. W. H. Rounds, representing the Aetna company, Chicago; Capt. J. J. Orr, representing P. H. Fleming & Co., Chicago; Capt. Geo. McLeod, representing Smith Davis & Co., Buffalo; Capt. John Perew, representing Worthington & Sill, Buffalo, and Capt. Wm. Morris, representing J. J. Clark of Detroit. John H. Ryder of Cleveland made the photograph, of which the engraving is a reproduction.

A Supreme Court Admiralty Case.

A question of unusual interest to vessel owners and underwriters will be determined by the supreme court probably during the present month. It grows out of the loss of the barges Eldorado and Geo. W. Wesley, near Erie in November, 1880, while in tow of the steamer J. P. Donaldson. The tow was proceeding from Buffalo to Bay City, encountered a violent storm and was driven on a lee shore. The steamer, finding she could not pull the barges clear, after signaling her intention so to do, cut the tow line and escaped, the barges being driven on shore and wrecked.

An action was brought in the United States district court at Detroit, in which recovery for the lost barges was sought on a claim of negligent towage. The case was heard before the present Mr. Justice Brown and the libel dismissed. The case then went to the circuit court and Mr. Justice Matthews, on the the question of negligent towage, sustained the lower court, but held that the facts made a proper case for contribution in general average, and that the steamer must contribute for the loss of the barges.

The case went to the circuit court of appeals for the sixth circuit, and was by it certified to the supreme court for instructions on the question of whether it was a proper case for contribution. The real question seems to be whether contribution may be enforced between steamer and tow.



Capt. Chas. Davis, Capt. John Perew, Capt. A. L. Fitch, Capt. Wm. Morris, Capt. Cyrus Sinclair, Capt. J. J. Orr,
 Capt. Geo. McLeod, Capt. W. H. Rounds, Capt. John V. Tuttle, Capt. Daniel McLeod.

LAKE WRECKING MASTERS ENGAGED IN COMPILING THE INLAND LLOYD'S REGISTER.

SUPPLEMENT TO THE MARINE REVIEW. CLEVELAND, O., MARCH 4, 1896. VOL. XIII, NO. 10.

Photograph by John H. Ryder, Cleveland.

Engines of 27-Knot British Torpedo Boat Chasers.

The propelling machinery of three 27-knot British torpedo boat chasers, built by the Fairfield Ship Building & Engineering Co., Glasgow, and named Handy, Hart and Hunter, are illustrated on this page. The engravings are reproduced from Engineering of London. The boats are 194 feet long by 19 feet 4½ inches beam and 12 feet 7½ inches depth, their displacement in service trim being 245 tons. The engines are of the three cylinder triple expansion type, (other British firms have preferred four cylinders with three expansions for vessels of this kind), and the cylinders are 18¼, 27½ and 42 inches diameter with a common stroke of 18 inches. All have piston valves. The cylinders are of cast iron, and with each was cast also the valve casing. The cylinder and casing bottoms, which are separate from the cylinders, are also of cast iron. The cylinder covers, however, are of cast steel and of light design, while the casing tops are of rolled steel plate and dished to give the necessary stiffness. The pistons are of the conical or dished pattern, made from high-tension forged steel. The connecting and piston rods are made from forged mild steel and bored. The guide shoes, which are separate from the piston-rods, are of gun metal lined with white metal, and they can be readily adjusted. The guides, which are of cast iron, are attached, one at the top end to the cylinder bottom, the other to a crossbar midway down the columns, and it in turn is held in place by the cross-stays. The valve gear is of the usual bar-link and double-eccentric description, the eccentric rods being made of mild steel with adjustable gun-metal bushes at the top end. The straps are also of gun metal, and lined with white metal.

The three-throw crankshaft is made from mild steel, and in one piece. The body of the shaft and crankpins are 6 inches in diameter,

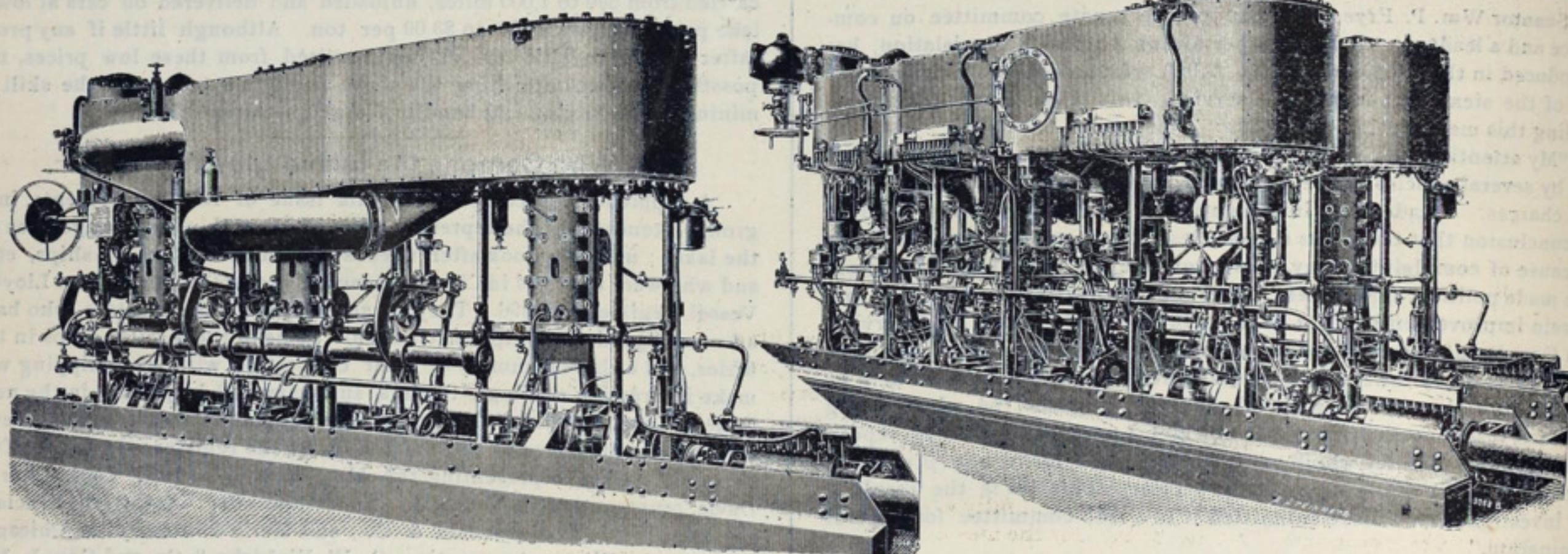
pump is of the single-acting description, 18½ inches in diameter, and having a stroke of 4 inches. The head and foot valve and the bucket are fitted with metal annular group valves. The pump is driven by a separate crankshaft from the end of the main crank.

The boilers, three in number, are arranged two in the after boiler compartment and one in the forward. They are of the Thornycroft Darling type modified. Each boiler has 63 square feet of grate surface and 3168 square feet of heating surface. The boilers are constructed for a working pressure of 210 pound and were tested to 300 pounds per square inch. The vessels have only two funnels. The forward funnel is used for the boiler in the fore compartment, as well as for one of the boilers in the after boiler space. The after funnel is used for the remaining boiler and also in connection with the ventilation of the engine room.

On six runs, one of the vessels equipped with this machinery, the Handy, averaged 27.006 knots, the speed during one run averaging 27.481 knots. During the run in which the highest speed was attained the mean indicated horse power was 4,677, vacuum 24½ inches, steam pressure 195 pounds, air pressure 3¼ inches, and revolutions 388.4 and 397.5 for port and starboard propellers respectively.

Just Double the Suez Traffic.

It is truly wonderful to find that the net registered tonnage of vessels passing through the Suez canal during the full calendar year 1895 was barely one-half the tonnage of vessels passing through the two canals at St. Mary's falls during 231 days of navigation on Lake Superior in the same year. This comparison applies as well, of course, to the American canal alone at the Sault, as the new Canadian canal was open to navigation for only eighty-seven days in 1895, and the commerce pass-



ENGINES OF 27-KNOT BRITISH TORPEDO BOATS.

with a 3-inch hole. The crank, crankpin, cheeks, and moving gear have been carefully balanced by means of weights suitably placed. The tunnel shaft is 6 inches in diameter with 3¼-inch hole; the propeller shaft is 6¼ inches in diameter, with 3¼-inch hole bored throughout. The thrust blocks are of the ring description, made of cast iron, and lined with white metal at the bearings. The block is also water-jacketed.

Cylinders are each supported on four wrought steel columns, their bottom ends passing through the cast steel bearers, being fastened thereto by nuts on the under side. The barriers are of H-section. The main bearing bushes are of gun metal, lined with white metal; these bushes are held in position by wrought steel caps, each having two steel studs. The cross-bearers are bolted at each end to the fore-and-aft portions of the soleplates, which are made from rolled steel angle-bars, these bars being planed on the face and bottom. The fore-and-aft portions of the soleplate or angle-bars are continued forward to receive the air pump, and aft to carry the thrust blocks. By this means the engines are complete and self-contained, so that all strains are well distributed over the shipwork. It will be seen from the design that diagonal bracing is dispensed with, the cylinders for each set of engines being bolted together in a fore-and-aft direction, and diagonal stays are carried from the cylinders to the fore-and-aft bulkheads. The cylinders of the two sets of engines are tied in the athwartship direction together, and also to a fore-and-aft stiffener at the ship's sides. The engines are so placed in the engine-room that there is a passage between, and also between the engine and its corresponding condenser, which is in the wings and on a low level. The condensers, with their tubes and ends, are of brass, the steam being led in on the top and diagonally to give free distribution. Circulating water to the condensers is supplied by two centrifugal pumps having 8-inch discharges, and sufficient for moderate powers. The air

ing through it was but about 4½ per cent of the entire Lake Superior commerce, with the great bulk of it in American vessels. The Suez canal passed last year 3,434 vessels of 8,448,383 net registered tons, while the commerce, of the two canals connecting Lake Superior with other parts of the chain of great lakes involved, during 231 days of navigation in 1895, the passage of 17,956 vessels of 16,806,781 net registered tons. These figures are official, as those relating to the Lake Superior canals are furnished by the United States war department, while the Suez statistics have just been received from the London office of that canal. A more extended comparison of these statistics will be found at the head of the editorial columns in this issue.

A representative of the REVIEW was in the east recently calling on concerns that supplied material or machinery for lake vessels. One of the most interesting calls was upon the largest concern of its kind in the United States, the B. F. Sturtevant Co. of Boston, Mass. This company has furnished some fifty or more blowers for draft apparatus on lake steamers, the North West and North Land being equipped entire with their machines. Some 75,000 blowers of all kinds are turned out of the Jamaica Plains works each year, the foreign trade requiring a large number. The varied uses to which the machines are applied can be imagined from the fact that a blower was shipped recently to a crematory at Washington. The engine department and electrical departments would in themselves make a large separate business. Their upright engine and direct connected dynamos are very compact. There is no position in which they do not place their blowers on shipboard, using space which can not be utilized in any other way. The engineers of the company have collected some valuable data from steamers having different systems of forced draft and this is available for the information of customers.

Mr. J. E. Upson.

A photograph, taken recently, gives the REVIEW an opportunity to jot down a few notes regarding J. E. Upson, president of the Upson-Walton Co., Cleveland, who has been connected with the ship chandlery business here for twenty-five years, but who is very unassuming and is rarely heard of in print. Mr. Upson was born at Tallmadge, O., about fifty years ago. His parents were natives of Connecticut, and were early settlers on the Western Reserve. His business life commenced as a very youthful clerk at Waterbury, Conn., and as bookkeeper in the em-

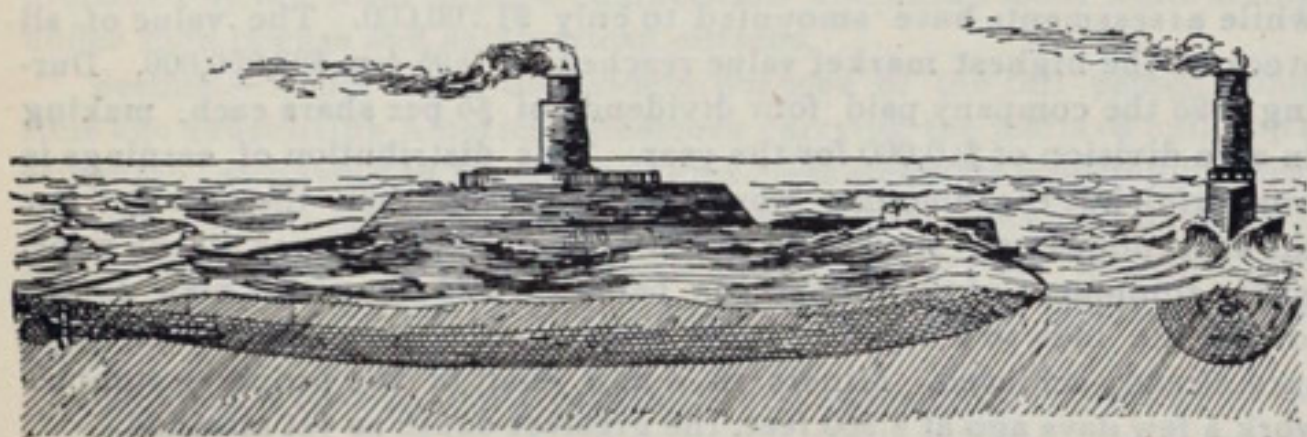


ploy of the Scovil Manufacturing Co. in New York City. He was graduated from Eastman's business college in Poughkeepsie in 1864, and soon after entered the U. S. army as an Ohio volunteer. Upon his honorable discharge at the close of the war, he came to Cleveland and entered the employ of Wm. Bingham & Co. where his partner of later years, Mr. J. W. Walton, had preceded him. Just before the death of L. L. Lyon, in 1869, Mr. Upson was called to a responsible position in the ship chandlery store of that gentleman, which he filled with credit until his association with Mr. Walton, in the same line of business, on Feb. 1, 1871, the Lyon establishment having passed into the hands of Messrs. J. W. Grover & Sons a year previous.

Mr. Upson is also a director in the Wilson Transit Co., Cleveland, and is very much interested in various philanthropic enterprises. Though a grandfather, he is in the prime of life and gives strict attention to all details of business in the house of which he is chief, the scope of which has grown far beyond the modest proportions of twenty-five years ago.

The Holland Submarine Torpedo Boat.

In a recent issue of the New York Sun the submarine torpedo boat that is being built for the United States government after the plans of John P. Holland is fully described. The boat is cigar shaped and 84 feet long, with a diameter of 11.5 feet amidships. When wholly submerged she displaces 168 tons; when light upon the surface, 154 tons. To drive

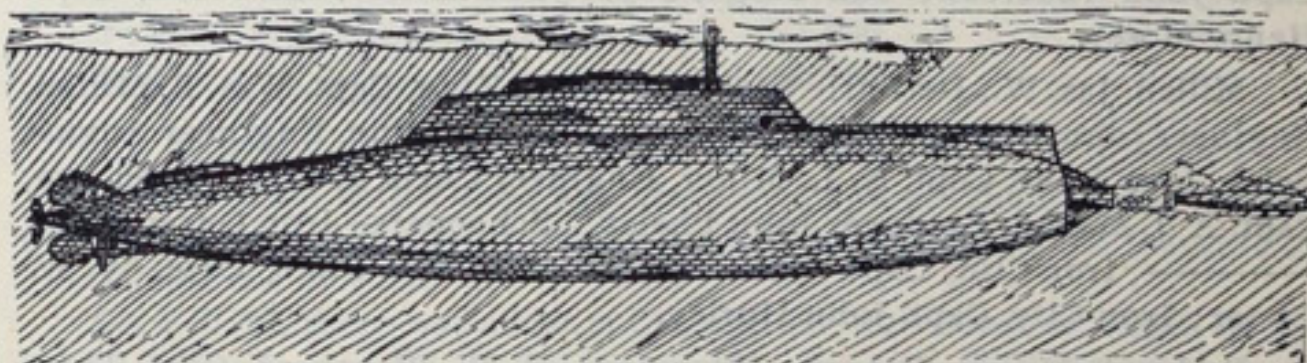


THE HOLLAND BOATS AS SEEN WITH NO ENEMY IN VIEW.

her through the water when her upper works are above the surface she has two sets of triple expansion engines of 650 horse power each, turning twin-screws, and a third engine of 325 horse power turning a third screw. Petroleum is used as fuel. So when full power is exerted she is, like the cruiser Columbia, a triple-screw boat. With her steam power at work

and the boat light on the surface, she must make 15 knots an hour by contract, while the speed when she is just awash must be 14 knots, and the speed by electric power when wholly submerged 8 knots. The contract provides that she maintain speed awash for 1,000 miles. She must maintain her speed of 8 knots submerged for sixty miles. It is intended that she be able to make 12 knots submerged for a mile or thereabouts. The exposed portion is protected with 8 inches of Harveyized steel—an ample thickness to turn the projectiles of the best rapid-fire guns.

When desirable this vessel could lay her course either while awash or by the camera and then plunge down and continue the course for hours. Big valves, easily controlled, flood certain compartments with water until there is very little buoyancy in the craft. Meantime two



SUBMERGED BUT HOLDING THE ENEMY IN VIEW.

horizontal rudders, that act much as a duck's feet do, are tipped up, throwing the stern up and the bow down, and under she goes. Of course the smokestack and the furnace doors must be sealed tight simultaneously, and every other opened closed. It is planned that she shall disappear, when running on the surface at full speed, within twenty seconds, after the order to do so is given. Steam at high pressure will be left in the boiler as she goes down, and this will be used to run the propellers until she is exhausted. Then the steam engines are uncoupled, and the electric motors connected. Valves from the tanks of compressed air are opened enough to keep the crew supplied with air, and an apparatus to pump out foul air is set going when needed.

Incandescent electric lights are provided. A tested gauge shows the depth to which the boat passes. A large tank of water may be emptied instantly by connecting it with the compressed air reservoirs in case it were desirable to check quickly the downward movement. A reserve of buoyancy amounting to 375 pounds is provided for, so that in case everything went wrong the boat would come to the surface, but should it be desirable to lie still in one place not anchored to the bottom (an anchor is provided) two horizontal screw propellers, worked by electricity, will keep her down. It is arranged that every change in load or ballast is compensated for in such manner that the center of gravity remains in place. There is a rubber tube device that may be sent up to the surface to renew the supply of air. Provisions for a three-days' stay under water are to be carried. Two telescoping expulsion tubes for 18-inch White-



AS SEEN AWASH.

head torpedoes are provided, and five torpedoes must be carried to supply them. These will be fired, of course, as from any torpedo boat, and they can be fired when she is submerged or on the surface. No attempt to run under a battleship and attach torpedoes to her bottom, as Esra Lee tried to do, nor to drag floating torpedoes against her would be made, because such efforts would not be likely to succeed. It is worth noting that in designs for this class of boats recently submitted to the Japanese government an armament of pneumatic dynamite guns was provided for as well as the ordinary Whitehead torpedoes. Any of the first-class ship yards of the United States can turn out six of these submarine boats in three months, and the cost of the six would not exceed \$1,000,000. The present submarine boat is confessedly not the best that might be made, because it is too small, but as the first it is good enough,

In former years Toledo shipped large quantities of wheat by lake to Buffalo and received little if any wheat by lake. Last season the receipts at Toledo were far in excess of the shipments, but this was due largely to a light grain crop in the territory tributary to that point. It would seem, however, that Chicago will again send considerable wheat to Toledo on the opening of navigation, as vessel room was provided in Chicago a few days ago for a lot of 175,000 bushels of wheat to be moved to the Ohio port in the spring.

SUBSCRIBERS WILL AVOID DANGER OF MISTAKES BY GIVING THE OLD AS WELL AS THE NEW ADDRESS WHEN A CHANGE IS DESIRED.

Appointments of Masters and Engineers.

Ann Arbor Car Ferry Line, Toledo, O.: Steamers—Ann Arbor No. 1, Capt. Peter Kelley, Engineer A. W. Ackerman; Ann Arbor No. 2, Capt. W. P. Robertson, Engineer T. H. Cosgrove.

Cook, H. W., Chicago: Steamers—Thos. Davidson, Capt. James O. Wood, Engineer A. W. Wilcox; Walter Vail, Capt. John McAvoy, Engineer Dennis McMillan. Schooner—Baltic, Capt. John O'Neil.

Parker, A. A., Detroit: Steamers—A. A. Parker, Capt. J. T. Hutton, Engineer Jas. Falconer; John Oades, Capt. Timese Lemay, Engineer Jacob Zeh; John Pridgeon, Jr., Capt. D. N. Sherwood, Engineer John Morgan. Schooners—B. W. Parker, Capt. Edward Lohr; Red Wing, Capt. John Anderson; San Diego, Capt. John Mason; Saveland, Capt. Henry Morey.

Millen, Jas. W., Detroit: Steamers—Iron King, Capt. Wm. F. Millen, Engineer John Hegemer; Iron Chief, Capt. W. A. Irvine, Engineer August Cobo; Iron Duke, Capt. N. L. Miner, Engineer Chris. Howard; Iron Age, Capt. A. J. Mahon, Engineer John Phelan. Schooners—Iron Queen, Capt. ———; Iron Cliff, Capt. Thos. Fitzsimons; Iron State, Capt. W. W. Carter; Iron City, Capt. John Hurley.

Parker & Millen, Detroit: Steamers—B. W. Blanchard, Capt. Thos. Meikleham, Engineer E. W. Tilley; Greyhound, Capt. Bert Baker, Engineer D. J. McMillan; City of Toledo, Capt. ———, Engineer ———. Wrecking Steamers—Favorite, Capt. P. L. Millen, Engineer Geo. L. Simons; Saginaw, Capt. Thos. Hayes, Engineer M. Clancey; Wales, Capt. Thos. Hagan, Engineer L. Cronk. Tugs—Balize, Capt. Thos. Carney, Engineer Chas. Scott; Onaping, Capt. J. E. Tobin, Engineer Neil Maitland.

St. Lawrence & Chicago Steam Navigation Co. (Ltd), John H. G. Hagarty, Manager, Toronto, Ont.: Steamers—Algonquin, Capt. James McMaugh, Engineer Jas. H. Ellis; Rosedale, Capt. James Ewart, Engineer Richard Childs.

Ashley & Dustin, Detroit: Steamers—Frank E. Kirby, Capt. A. J. Fox, Engineer E. Perry; Wyandotte, Capt. John Desana, Engineer Julius Holder;

Goodrich Transportation Co., Chicago, Ill.: Steamers—Virginia, Capt. H. E. Stines, Engineer G. P. Roth; Indiana, Capt. A. Gallagher, Engineer Ray Flint; City of Racine, Capt. John Wilson, Engineer J. A. Parkes; Atlanta, Capt. Wm. Nicholson, Engineer W. H. Jerome; new boat building at Manitowoc, Capt. John Raleigh, Engineer Jules Bushman; City of Ludington, Capt. E. Carnes, Engineer John Callan; Chicago, Capt. Geo. Wittey, Engineer Felix Neidert; Muskegon, Capt. Munger, Engineer T. Dorsey; Sheboygan, no appointments.

Blodgett, O. W., Bay City, Mich.: Steamer—C. H. Bradley, Capt. James Bennett, Engineer Adam Haig. Schooners—Mary Woolson, Capt. Wallace Allan; Peshtigo, Capt. Lee D. Bennett; Brightie, Capt. F. H. Lennon; Goshawk, Capt. W. Nagle; B. W. Jenness, Capt. Thomas Turner.

Niagara Navigation Co., John Foy, Manager, Toronto, Ont.: Steamers—Chippewa, Capt. J. McGiffin, Engineer R. McCaul; Chicora, Capt. J. Harbottle, Engineer H. Parker; Ogiara, Capt. H. McIntire, Engineer ———; new boat under construction, Capt. W. H. Tolmes, Engineer W. Walsh.

Safety Freight Line, Geo. J. Bennett, Manager, Port Huron, Mich.: Steamer—Cleaveland, Capt. Geo. J. Bennett, Engineer Thos. Treleven. Schooners—Eureka, Capt. Joseph Adams; Magnet, Capt. James Blair.

Minch & Nicholas Transit Companies, P. J. Minch, Manager, Cleveland: Steamers—I. W. Nicholas, Capt. Wm. Gerlach, Engineer Wm. Miller; Onoko, Capt. W. H. Johnson, Engineer A. J. Bohland; Philip Minch, Capt. Wm. Young, Engineer Andrew Nelson; Horace A. Tuttle, Capt. C. Young, Engineer W. H. Donovan; John N. Glidden, Capt. Jos. Lampoh, Engineer Wm. Downing. Schooners—Dundee, Capt. Horace Fisher; Aberdeen, Capt. Frank Coles; Sophia Minch, Capt. A. Leland; G. H. Warmington, Capt. Geo. N. Kunne.

Miller J. B., Toronto, Ont.: Steamer—Seguin, Capt. James B. Symes, Engineer Samuel Gillespie.

Dulac, Capt. Wm., Mt. Clemens, Mich.: Steamers—Norwalk, Capt. E. F. Matteson, Engineer A. J. Wilson; C. A. Street, Capt. A. P. Gallino, Engineer C. F. Lamb; F. R. Buell, Capt. C. W. Woodgrift, Engineer John Deihl; Canisteo, Capt. W. J. Lynn, Engineer W. G. Boynton; A. Weston, Capt. M. Hyde, Engineer C. S. Peltier. Schooners—Jeremiah Godfrey, Capt. J. B. Lozen; J. B. Lozen, Capt. Ed. Moore; A. Stewart, Capt. John Destrois; S. B. Pomeroy, Capt. Jas. Germain; Eleanor, Capt. Frank Dubay; Jennette, Capt. Wm. Dubay; Fulton, Capt. Frank Laforge; Elvina, Capt. Wm. Campau.

McCormick, L. H., Menominee, Mich.: Steamer—Simon J. Murphy, Capt. D. Morrison, Engineer Louis Gelinias.

Minneapolis, St. Paul & Buffalo Steamship Co., Buffalo: Steamers—Pillsbury, Capt. James Jackson, Engineer John Davidson; Washburn, Capt. Charles E. Moody, Engineer Bion St. Bernard; Nebraska, Capt.

Peter Thompson, Engineer Joseph Taylor; John Pridgeon, Capt. D. N. Sherwood, Engineer John Morgan.

Inter Ocean Transportation Co., Milwaukee: Steamers—Maryland, Capt. J. E. Yax, Engineer M. Conley; Manchester, Capt. Timothy Kelley, Engineer James Grant; Manhattan, Capt. H. F. Loftus, Engineer R. W. Patterson; Massachusetts, Capt. P. A. Anderson, Engineer Ahern; Merrimac, Capt. Matt Smith, Engineer R. Allison; Minnesota, Capt. B. Sniffin, Engineer W. H. Pinkham. Schooner—Metacomet, W. L. Shields.

Lakewood Transportation Co., William S. Mack, Manager, Cleveland: Steamers—Geo. W. Roby, Capt. Jos. A. Holmes, Engineer William Young; P. P. Pratt, Capt. George W. Pierce, Engineer R. A. Hannah; V. H. Ketcham, Capt. W. C. Butts, Engineer John McEachren. Schooners—Wm. D. Becker, Capt. Geo. Richards; Wadena, Capt. George Mackie; Anna M. Ash, Capt. Harvey Peters.

Ship Yard Matters.

Nearly all of the ship yards that are engaged on the new Rockefeller vessels have put on night forces. In one or two cases 200 to 400 men are engaged on these night shifts. The largest night forces are probably engaged at the Globe company's yard, Cleveland, and at the Detroit Dry Dock Co.'s yard, Wyandotte, Mich. The night shifts prepare material in the shops, so as to keep the outside workmen fully engaged by day.

Difficulty with the force of rivet heaters at F. W. Wheeler & Co.'s ship yard, which delayed other workmen in the yard, and which it was thought might result in more important differences among the men, was partly the cause of further delay in launching the Eddy-Shaw and Roby steamers. These ships were not launched on Saturday last, although some preparations had been made to launch them.

Capt. W. H. Singer, owner of harbor tugs at Duluth, has contracted with E. W. Heath of Benton Harbor, Mich., to build a tug that will cost about \$13,000. She will be 80 feet long, 19 feet beam and 11 feet hold.

The Globe Iron Works Co., Cleveland, has placed an order with the Whiting Foundry Equipment Co. of Chicago, for a Whiting foundry cupola, which will have a capacity of eighteen tons per hour. The cupola is 7 feet in diameter.

A Detroit correspondent says of ship building operations and repair work in that city: "Immediately upon completion of the heavy repair job to the Northern line freight steamer Northern Wave at the Detroit dry dock company's big dock, the car ferry Shenango was put into the dock and fitted with new wheels. She was also given other minor repairs. Her place was quickly taken by the cargo steamer Selwyn Eddy, upon which nearly 100 men are at work, and from which something over fifty plates are to be removed. This job will take about three weeks. The Eddy is also to receive a new wheel. The big passenger steamer City of Buffalo is rapidly approaching completion. Nearly all of her machinery is in place, and to the casual observer she appears about ready for business. The floats, or buckets, of her wheels attract special attention. They are entirely of steel and, of course, have a much more mechanical appearance than the old style of wooden buckets. In the large machine shops of this company the engines for the first of the 400-foot steamships building at Wyandotte are ready for shipment, while those for the smaller boat on the stocks at the same place (the Jones steamer) are well advanced. Howden hot draft apparatus, which is being fitted to several ships, is also very plentiful around the shops. Four large Scotch boilers for new ships are under construction in the boiler shop, and there is also a new boiler under way for the wooden steamer Progress, as well as a large amount of repair work. At the Detroit Boat Works, Belle Isle bridge, a new 35-foot steam yacht, with a large number of life boats, are under construction, and the steam yacht Pastime, owned by Mr. F. H. Walker, is undergoing an extensive overhauling."

Another dividend, aggregating \$500,000, has just been paid to owners of the Calumet and Hecla mine, the great Lake Superior copper property. This makes the total of dividends paid by the company to date \$45,350,000, while assessments have amounted to only \$1,100,000. The value of all stock at the highest market value reached in 1895 was \$23,000,000. During 1895 the company paid four dividends of \$5 per share each, making in all a division of \$20,000 for the year. This distribution of earnings is wonderful, but the amounts would be far greater than they are but for the stupendous new work and lavishness of expenditures at the mine, where equipment of the property is being carried on with a view to following the lode to a depth of 10,000 feet, or more than double the distance already achieved. Miners in a new shaft of the property stopped work a few days ago at 4,900 feet, the greatest depth as yet attained.

Why not patronize the Nickel Plate road on your next trip to New York City or Boston? They operate solid through trains, elegantly equipped with palace sleepers and fine day coaches, attended by uniformed colored porters whose duties require them to look out for the comfort of passengers; magnificent dining cars. The popular low-rate short line.

A Cathode Ray Photograph.

A great deal of attention is being given to the new cathode ray photographs. The intense light shows through substances that are considered opaque, discovering and showing such objects as the bones in a man's hand, or the outline of the brain in his head. The REVIEW sub-



mits an alleged example of this photography. The object is the new tug C. L. Boynton, which is known to be very close to the heart of the gentleman whose portrait also appears in the picture—Capt. Robt. P. Thompson, formerly of the tug Brockway and now manager of the Thompson Tug Line, Port Huron. In view of the fact that the Boynton is among the finest tugs on the lakes, and one of the largest of her class, it would not be difficult to sum up arguments against the genuineness of the picture, as a sample of results obtained from the new X ray process, but it represents Capt. Thompson's estimation of his new boat. The Boynton is 95 feet over all, 22 feet beam, and 10 feet deep, and has a compound engine 17½ by 34 by 30 inches.

Directed Against Canadians on Lake Steamers.

Marine engineers throughout the country are certainly availing themselves of every opportunity to pass the Squire bill, which requires full citizenship and makes all engineers officers of steam vessels. Resolutions and memorials are being forwarded to congress from all sections of the country, and on the lakes now the bill is being urged from the standpoint of danger involved in permitting Canadians to hold place in the engine rooms of lake vessels. The following memorial covering this feature of the subject has just been forwarded to congress by Cleveland engineers:

"We, the members of association No. 2 of the National Marine Engineers Beneficial Association, most respectfully petition your honorable body for the favorable consideration of the bill relating to marine engineers, presented by Senator Watson C. Squire. We desire to impress your honorable body with the justice of the measure as affecting our rights as American citizens, and also with its advisability as a safeguard to American shipping and American property in case of war. We submit:

"First.—That it is but justice to the citizens of the United States who are engaged as engineers in the merchant marine, and who are compelled, as such, to pass a rigid examination before our United States inspectors, to receive a license permitting them to practice their art, that they be protected by law from foreign competition and cheap labor while acting under such license and as American citizens.

Second.—While it was the evident purpose of the bill passed some time ago subsidizing American steamers carrying the mails to build up a safeguard, by having in time of war first-class steamers officered by loyal citizens, still the fact remains that by perversion of the spirit of the law it is now but necessary for a foreign engineer to declare his intentions before securing a license to assume control of the most vital part of the ship.

And last.—That the close proximity of Canada to our points of shipping on the great lakes renders it possible for foreigners to obtain licenses as engineers in charge of the motive power of American ships, and earn their livelihood in competition with American citizens, and at the same time retain their residence and citizenship in Canada; and as it has been shown conclusively in the last few months that this frontier would be an important point in case of war with an unfriendly power, we contend that as the safety of our ships is dependent in a large measure on

their motive power, this power should only be entrusted to the care of men who have no affiliation with any foreign power and whose citizenship is fully completed."

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Feb. 29, 1896:

	Wheat, bushels.	Corn, bushels.
Chicago.....	19,970,000	3,928,000
Duluth.....	11,450,000	102,000
Milwaukee.....	396,000
Detroit.....	295,000	12,000
Toledo.....	371,000	757,000
Buffalo.....	1,825,000	91,000
Total.....	34,667,000	4,890,000

As compared with a week ago, the above figures show at the several points named a decrease of 466,000 bushels of wheat and an increase of 649,000 bushels of corn.

On Feb. 29, there was afloat at Chicago 281,000 bushels of wheat, 4,574,000 bushels of corn and 793,000 bushels of oats; at Buffalo, 259,000 bushels of wheat, 223,000 bushels of oats and 250,000 bushels of barley; at Duluth, 512,000 bushels of wheat; and at Milwaukee 176,000 bushels of wheat and 120,000 bushels of oats.

New Engineering Journal.

The Western Society of Engineers, which has headquarters in Chicago, has begun the publication of a journal. The first number is highly complimentary to the society. It contains as a supplement, several profiles designed to show the shallows and obstructions along natural water routes, from Chicago and Duluth in the west to Quebec and New York in the east, via the several great lakes and their connecting waters, the St. Lawrence river and the Champlain-Hudson valley, all referred to mean tide at New York. The scale adopted is 10 feet vertical to each centimeter, and one mile per centimeter horizontal. This first number of the journal also contains an article on dry docks of the great lakes, by A. V. Powell of Chicago. The office of this publication is at 1737 Monadnock block, Chicago.

Largest Harbor Tug Business on the Lakes.

Information has been given out concerning the acquisition of the tug interests of Ashtabula by the Ashtabula Tug Co., which is managed by W. A. Collier, general manager of the well-known Vessel Owners' Towing Co. of Cleveland. This makes a total of sixteen tugs managed by Mr. Collier, and owned by a company composed largely of the principal



vessel owners of Cleveland. There is hardly a tug company on the lakes with such strong financial backing, and there is certainly no company whose interests include the control of one fourth as many modern freight steamers. While there is no intention of forming a general combination, the two companies are thinking seriously of placing four powerful tugs at the Sault the coming season. This, as well as the Ashtabula move, is in the line of furnishing better service for the vessels controlled by the stockholders.

One fare for the round trip, March 9th, 10th, and 11th, is the rate via the Nickel Plate road to Columbus, Ohio, for the Republican state convention, from all points in Ohio.

24-Mar. 10.



DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department on June 30, 1895, contained the names of 3,342 vessels, of 1,241,459.14 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1895, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels.....	1,755	857,735.00
Sailing vessels.....	1,100	300,642.00
Unrigged.....	487	83,082.00
Total.....	3,342	1,241,459.00

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30,	Number.	Net Tonnage.
1891.....	204	111,856.45
" " " 1892.....	169	45,168.98
" " " 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,353.00
Total.....	747	334,634.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.
(From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal.		
	1895.*	1894.	1893.	1895.	1894.	1893.
No. vessel pass'ges	17,986	14,491	12,008	3,434	3,352	3,341
T'n'ge, net registd	16,806,781	13,110,366	9,849,754	8,448,383	8,039,175	7,659,068
Days of Navigat'n	231	234	219	365	365	365

* 1895 figures include traffic of Canadian canal at Sault Ste. Marie, which was about 4½ per cent. of the whole, but largely in American vessels.

Entered at Cleveland Post Office as Second-class Mail Matter.

REAR ADMIRAL AMMEN, who has all along been known to be greatly displeased with the action of the bureau of construction, navy department, for making numerous changes in the design of the Ammen ram Katahdin, has awaited the acceptance of the vessel by the government before entering protest. He has now written a forcible letter to the secretary of the navy, wherein he denounces the methods on which the ram was built, and as she stands repudiates her entirely. "With an adroitness beyond comprehension," reads the admiral's letter, "I find that the so-called 'Ammen ram,' which was required to be built under a special law, has been so changed that she is no longer the 'Ammen ram,' as designed by me, and is a positive discredit to my reputation as a naval officer." The Ammen ram, on account of great novelty of design and apparent merit, was ordered built by act of congress against the wishes of the naval bureau of construction. The bow of the vessel as it now stands, and the manner in which it was strengthened by the bureau of construction, ostensibly to take the impact of a collision with a hostile ship, are what is said to grieve the admiral most. The Katahdin's bluntness of stem was never contemplated by the admiral, and to this he charges her failure to make her contract speed. The original design contemplated a more slender bow, which while less strong, was so planned that a portion of the ram bow could be carried away in a ramming engagement without damage to the vessel and could be replaced with spare parts to be carried along on board.

IF THE Detroit river bridge scheme is not defeated in the present congress it will not be the fault of Counsel Harvey D. Goulder of the Lake Carriers' Association, who has put in practically the entire winter in working up opposition to the bridge. If the present measure is defeated, it may be reasonably expected that no bridge will cross the river while Mr. Goulder lives. Senator McMillan's shrewdness is visible in the quiet report from the commerce committee of the senate favorable to the bridge. But the report of the senate committee is no assurance of passage of the bill. It has a long road to travel through the house, and even in the senate it will be fought with the vigor that has characterized the opposition for thirty years past. The fact that not a single senator from

a lake state, except Mr. McMillan, voted on the commerce committee report is worth noting.

THE INITIAL number of the Journal of the Western Society of Engineers contains an excellent likeness of the late Gen. Poe and a memoir very carefully written. It is said that with his first month's pay, earned on a farm in Stark county, Ohio, Gen. Poe purchased three books—a grammar, an arithmetic and a book on literature, and from these he secured the beginning of his education. He was twenty years of age when appointed to a cadetship at West Point.

NOTWITHSTANDING all the war talk now going on in Washington, the house naval committee hesitates about recommending to congress a naval bill providing for six battleships and fifteen torpedo boats, while in England the admiralty has just submitted a program involving the construction of forty-six new ships of war—five battleships, four first-class cruisers, three second-class cruisers, six third-class cruisers and twenty-eight torpedo boat destroyers.

AN ARTICLE by J. W. Russell in the Review of Reviews for March deals with Canadian affairs bearing upon the expiration of the term of the present dominion parliament on April 25. Next to the tariff and the Manitoba school question, Mr. Russell refers to the problem of deep waterways as of highest importance.

Electric Drills for Ship Construction.

The use of electric motor drilling machines for drilling holes in the shell and deck plating of ships has been considerably developed within the past six months in the British dock yards, and the application of the system to the exigencies of war ship construction is likely to affect, in a very material degree, the rate of speed at which vessels may be completed. Electric drillers have also, of course, been employed for some considerable time in private yards on the Clyde and elsewhere. An electro-magnetic drill was introduced into some of the larger Clyde yards several years ago, by means of which holes could be drilled through plates fitted in position on the ship in a mere tithe of the time taken by the old clumsy system of drilling with the ordinary brace and ratchet drill. By the force of magnetism this tool was made to cling to the side of the vessel while doing its work. For some reason or the other, however, its use has not been extended, but rather curtailed of late, and machine tools adopted which require to be "held up" to their work, the requisite purchase to press the drill home being obtained from fixed staging or other erections alongside. The difficulty in regard to purchase has been satisfactorily overcome by one of the dock yard electricians, who has availed himself anew of the electro-magnetic principle. A portion of the electric current from the generating dynamo is diverted to powerful electro-magnets attached to the electric motor, and, by making the body of the vessel itself earth, the motor is made to cling to the deck or ship's side with such tenacity that the drilling tool works away just as though it had a tightening screw at its back, only much more steadily.

The magnets are short stumpy legs, three in number, each leg being an independent magnet having a positive and negative pole. Until recently only two magnet legs were employed, one being positive and the other negative. It was found that with only two magnet legs the purchase secured was unsteady, the electric motor vibrating and wobbling a good deal and the drilling in consequence being unsatisfactory. The adoption of the three legs, each having the two poles complete in itself, gives a perfectly steady working tool. When required to work, a small handle is turned which switches on the current, making the magnets adhere to the plate required to be pierced. Another small handle switches the current onto the drill, which starts at once. The drill is stopped and the motor detached with similar ease. For drilling holes in the vertical wall of a ship outside, the motor, with magnets, is suspended from a pole alongside, a rope being merely passed over the pole to support it. The motor is pulled along the pole with a pulley and another rope as the work advances. Electric drills of this, or it may be some still more improved type, have undoubtedly a most important future. With the adoption of the tripod electro-magnetic contact, not only drilling but slotting and planing may yet be accomplished on the plates as fitted in position in the hull of ships.

Orders for new freight ships now being let throughout Great Britain seem to drift to vessels of the largest class. The Peninsular & Oriental Co., the largest ship-owning concern in the world, placed orders recently with the Palmers company of Jarrow, and Caird & Co., of Greenock, for two twin-screw cargo steamers capable of carrying 9,000 tons each. The vessels will each have engines capable of developing 4,000 horse power.

Congressman Boutelle of Maine, chairman of the house committee on naval affairs, is a practical navigator. He was chief officer of the American steamer Conqueror in the years of 1856-57.

The Amended Engineers' Bill.

A copy of the marine engineers' bill, as amended and presented to the senate from the committee on commerce, is at hand, and just as suggested in the REVIEW of Jan. 30, page 9, the clause transferring to the supervising inspector-general the duty of reviewing all cases bearing upon the revocation of licenses, as well as the provision requiring examinations for all applicants for licenses ten days after they have asked for examinations, have been stricken out. These were features of the bill that were not specially important to the engineers, but which were objectionable to the inspection service, and it is well that they have been removed from the bill. The amended bill, which is now quite certain of passage, refers to changes in section 4,131 revised statutes, and is in full as follows:

"Vessels registered pursuant to law and no others, except such as shall be duly qualified according to law for carrying on the coasting or fishing trade, shall be deemed vessels of the United States, and entitled to the benefits and privileges appertaining to such vessels; but no such vessel shall enjoy such benefits and privileges longer than it shall continue to be wholly owned by a citizen or citizens of the United States or a corporation created under the laws of any of the states thereof, and be commanded by a citizen of the United States. And all the officers of vessels of the United States who shall have charge of a watch, including pilots, shall in all cases be citizens of the United States. The word officers shall include the chief engineer and each assistant engineer in charge of a watch on vessels propelled wholly or in part by steam; and after Jan. 1, 1897, no person shall be qualified to hold a license as a commander or watch officer of a merchant vessel of the United States who is not a native born citizen, or whose naturalization as a citizen shall not have been fully completed.

"All licenses issued to such officers shall be for a term of three years, but the holder of a license may have the same renewed for another five years at any time before its expiration; provided, however, that any officer holding a license, and who is engaged in a service which necessitates his continuous absence from the United States, may make application in writing for one renewal and transmit the same to the board of local inspectors with a statement of the applicant verified before a consul, or other officer of the United States authorized to administer an oath, setting forth the reasons for not appearing in person; and upon receiving the same the board of local inspectors that originally issued such license shall renew the same for one additional term of such license, and shall notify the applicant of such renewal.

"No master, mate, pilot, or engineer of steam vessels licensed under title 52 of the revised statutes shall be liable to draft in time of war, except for the performance of duties such as required by his license; and, while performing such duties in the service of the United States, every such master, mate, pilot, or engineer shall be entitled to the highest rate of wages paid in the merchant marine of the United States for similar services; and, if killed or wounded while performing such duties under the United States, they, or their heirs, or their legal representatives shall be entitled to all the privileges accorded to soldiers and sailors serving in the army and navy, under the pension laws of the United States.

"All laws or parts of laws in conflict with this act are hereby repealed. But this shall not be construed to modify or repeal that provision of the act of June 26, 1884, which reads as follows: "In cases where on a foreign voyage, or on a voyage from an Atlantic to a Pacific port of the United States, any such vessel is for any reason deprived of the services of an officer below the grade of master, his place, or a vacancy caused by the promotion of another officer to such a place, may be supplied by a person not a citizen of the United States until the first return of such vessel to its home port; and such vessel shall not be liable to any penalty or penal tax for such employment of an alien officer."

Trade Notes.

The American Ship Windlass Co. writes the REVIEW that they have had to add twenty-five men to their force to take care of a rush of orders for windlasses, capstans and towing machines.

J. C. Gilchrist, one of the leading Cleveland vessel owners, says in a letter to H. G. Trout, Buffalo: "We have used a number of your wheels on different vessels, and they have always given entire satisfaction. We find that in several cases they have increased the speed of the vessel and have also reduced the consumption of fuel."

The J. H. Parsons Chemical Co., Chicago, manufacturers of alkali water purifier, for the removal and prevention of scale in steam boilers, have within the past few days closed contracts with a dozen or more vessel-owning concerns in Cleveland to supply their goods for the coming season. They are meeting with like success in other parts of the lakes, retaining old customers and gaining new ones.

The Berlin Iron Bridge Co. of East Berlin, Ct., has just completed for the Citizens' Gas Co. of Bridgeport, Ct., two large buildings, one 63 feet wide by 171 feet long, comprising a purifier house, a meter house and valve house, and the second building, 44 feet wide by 122 feet long,

includes a generator house, a scrubber house and engine room. The side walls are of brick and the roof trusses of steel covered with corrugated iron.

DeGrauw, Aymar & Co., New York, shipped a car load of Tyzack anchors to the Chicago Ship Building Co., recently. This is in addition to some twenty-eight anchors of this make now in use on lake vessels. Mr. Smith of the New York company says they have an excellent trade on the lakes, and as their policy is to be liberal in business matters in order to satisfy their patrons they seldom lose customers. "When this does happen," he adds, "as a result of cutting prices, the customer usually returns of his own accord."

The Western Electric Co. of Chicago has just perfected a fire protection device which is attracting much attention among property owners and underwriters. The device is one for the automatic closing of iron doors in a building in case of fire. By this method the doors are held open by magnets and in case of fire a button is pressed, the power of the magnets destroyed and the doors closed by counter weights. Experiments are being made by the company with an automatic adjustment which will release the doors from the magnets at a certain temperature and greatly lessen the chances of fire spreading from room to room or even from one building to another.

The Van Duzen steam jet pumps are of unique simple design, and so constructed that when placed in position for regular duty they can not retain water while not at work, and hence can not freeze up in the coldest weather. Being made of brass, they will not crack or break because of extremes of temperature, and will stand greater strain and will not rust. They will always be found ready for work, and need no watching or constant looking after. When put in place, it is only necessary to put on steam and the pump starts, and turning off steam will stop it. It is used for many different purposes—in wells, pits, quarries, mines, river and lake sides, tube wells, in tanneries, mills, factories, on steamships, tugs and ferry boats. Thousands of them are in daily use, not only in the United States, but in at least twelve foreign countries. The cost ranges from \$7.00 for the smallest size, up to \$75.00 for the largest size, which will elevate from 10,000 to 15,000 gallons of water per hour to any height not exceeding 50 feet, vertically measured. Where the height exceeds 50 feet, but not over 100 feet, two pumps are used, one above the other. The E. W. Van Duzen Co., Cincinnati, Ohio, will take pleasure in sending price and illustrated catalogue free.

A contract for a steel freight and passenger steamer of about \$300,000 value, and which is to run between New York and Portland, Me., has just been placed by the Maine Steamship Co. with the Delaware River Iron Ship Building and Engine Works, Chester, Pa. The ship is to be about 315 feet in length and 46 feet beam, and in addition to large freight capacity will have about 110 state rooms for passengers. Engines will be triple expansion, and the boilers, of which there are to be four, will be of the Scotch type. This concern is also building two steel freight steamers in which a party of lake vessel owners are interested, and which are to run, in connection with the Central Vermont Railway, between New London and New York. One of these ships, which has been named Mohawk, was to have been launched on Saturday last, but she stuck on the ways. It is not thought, however, that there will be much difficulty in releasing her. These New London-New York steamers are 280 feet over all and 43 feet breadth of hull, but they have guards that increase the width of the principal freight deck to 60 feet, affording the advantage that is found in side-wheel steamers when handling package freight. The hull construction is especially strong, on account of the vessels being required to pass through considerable ice during some parts of the year in the trade in which they will be engaged. Engines are triple expansion, with cylinders of 22, 35 and 56 inches diameter and a stroke of 42 inches. Each ship will have three Scotch boilers of 12 feet 6 inches diameter and 12 feet length, allowed 165 pounds steam pressure and fitted with the Howden system of hot draft.

Another article on "Modern Ship Building Tools," with numerous engravings, appears in the March number of Cassier's Magazine. J. Arthur Gray, author of these articles, was for many years manager of a large concern in Scotland where the chief specialty was the manufacture of machine tools for ship yard and marine engine works. Subsequently he travelled much on the Continent, visiting the principal ship building concerns there.

Col. Wm. Ludlow, military attache of the United States embassy in London, has been inspecting the Corinth and Baltic-North sea canals, in obedience to orders from Washington, and has met with special favors at the hands of the German emperor.

Leslie Van Orman, who recently purchased the marine milk depot at the east end of Main street bridge, Cleveland, is making every effort to provide the best of accommodations in his line for vessels trading to Cleveland during the coming season.

Around the Lakes.

The United States revenue cutters will in future be painted white, as are the ships of the navy.

John Kelderhouse of Buffalo will manage the steel steamers America, Brazil and Maytham during the coming season.

Wm. H. Wood has joined Capt. J. A. Calbick in vessel brokerage business at Chicago. The firm will be J. A. Calbick & Co., and the office at No. 6 Sherman street.

The Davidson schooners Dundee and Aberdeen have been chartered to tow during the coming season behind the steamers H. A. Tuttle and John N. Glidden of the Minch fleet, Cleveland.

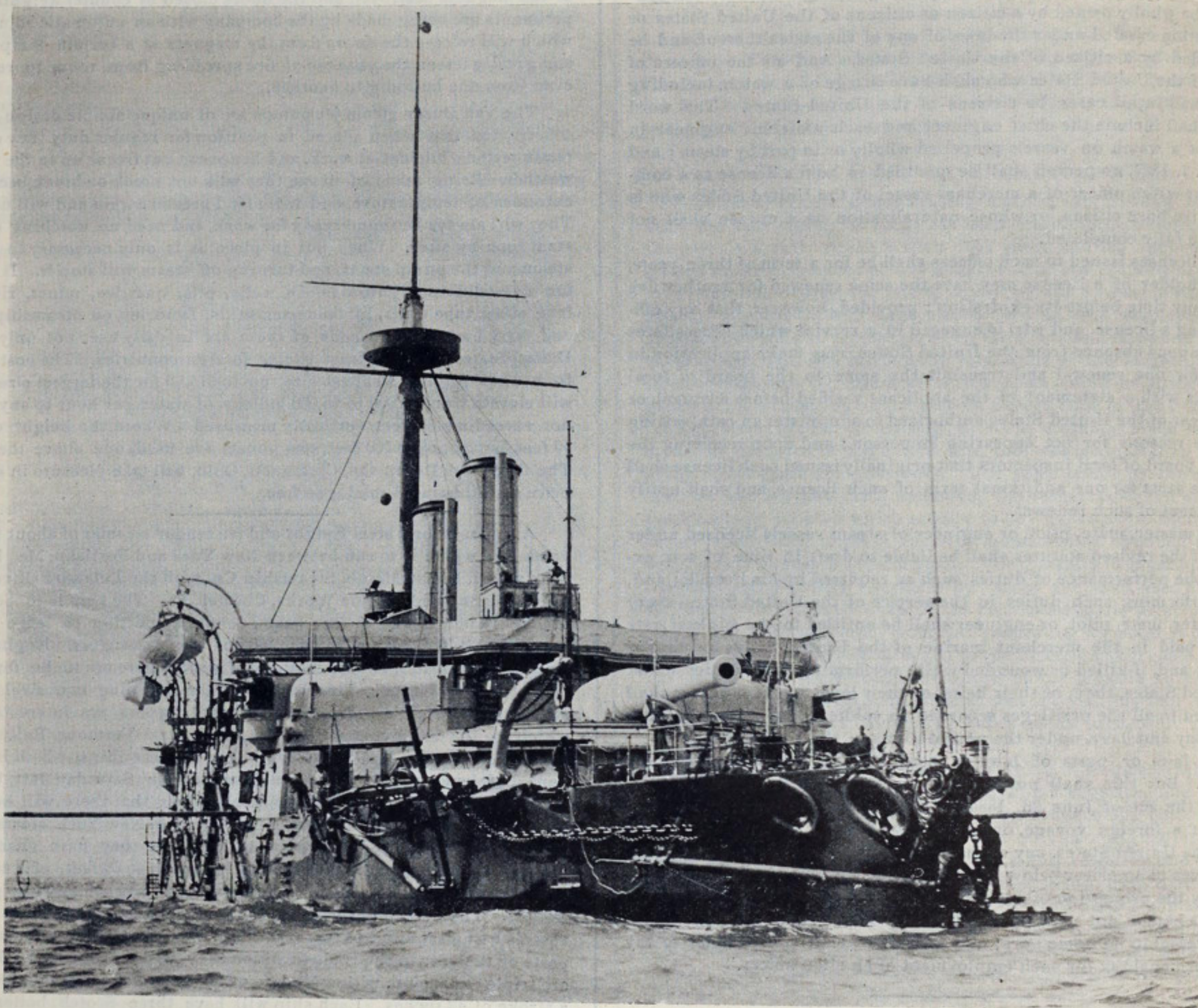
On birch bark paper enclosed in envelopes of the same material, Harvey of the Sault sends out an advertisement of his vessel reporting agency. The idea is novel and characteristic of the Sault.

prizes were awarded to the winners last week. Capt. A. Gallagher of the steamer Indiana won the captain's prize; W. H. Jerome, chief engineer, and John Flint, second engineer of the steamer Atlanta, won the prizes for engineers. The prize for stewards was divided between T. A. Egan of the steamer Indiana and H. J. McCarthy of the steamer City of Racine; and the prize for clerks was won by J. F. Fifield of the steamer Atlanta.

Miscellaneous Matters.

Capt. David Hutchinson of Port Huron, last season in the steamer Iosco, has been appointed to fill the vacancy in the command of the steamer Centurion, caused by the resignation of Capt. P. L. Millen.

Leading articles in the February number of the Journal of the American Society of Naval Engineers are quite technical, but there is the usual interesting collection of notes regarding new vessels of war as well as merchant ships building in different parts of the world. By an over-



A BRITISH SHIP OF THE FLYING SQUADRON TYPE.

Marquette has a new harbor tug company composed of Elwyn Williams, Charles McCabe, Samuel H. Gibson and John Helmert. The company has chartered the Chicago tug Calumet for the coming season.

Steamers in the "Soo" line of Buffalo during the coming season will be the Dyer, Nebraska, Pidgeon and George J. Gould, the latter of which was chartered recently. The Lake Erie line, trading between Toledo and Buffalo, will have the steamers S. C. Reynolds, John C. Gault and Russell Sage.

John E. Mills, Ed. J. Kendall and Capt. Charles Ludwig have purchased the barge Montgomery of H. M. Loud & Sons for \$3,800 cash. They will give her an entire rebuild and have her ready for the opening of navigation. Captain Ludwig will sail her and tow with the Nelson Mills in the lumber trade. Her capacity is 850,000 feet.

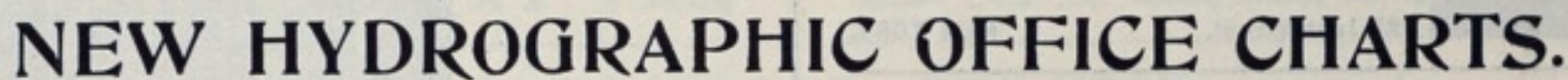
The sum of \$600 was allotted by the Goodrich Transportation Co., at the opening of navigation last season, to be distributed among the officers on their steamers who made the best record during last season. The

sight the REVIEW printed last week, without credit, an article from this journal relative to the accident recently in the engine room of the American line steamer St. Paul.

The board of army engineers appointed to make surveys and estimates for a canal through the state of Ohio connecting the waters of Lake Erie with the Ohio river has reported to congress through the secretary of war. As might be expected, the report of the engineers is entirely against the construction of a canal by any of the routes suggested.

Home seekers excursion to the southwest, March 10th, via the Nickel Plate road at lowest rates. Bear in mind that we operate an unexcelled dining car service and a line of magnificent through sleepers between Chicago, Buffalo, New York and Boston. 23-Mar. 10.

Reduced rate tourist tickets to California points are now on sale by all agents of the Nickel Plate road. Our trains make excellent connections at Chicago with through trains to the coast. 22-Mar. 31.



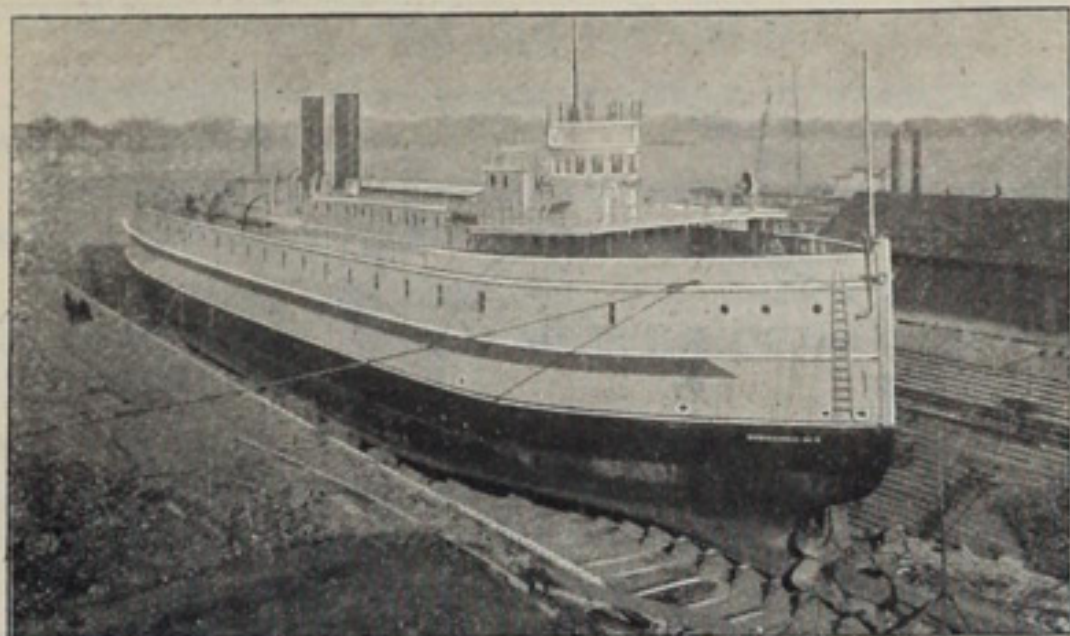
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CLEVELAND, OHIO.

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Shenango No. 2, 301 feet long, 54 feet beam.

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New Dry Dock—450 feet long, 110 feet wide on top,
55 feet wide on bottom, 16 feet of Water on Sill.

Repairs to Metal and Wooden Ships
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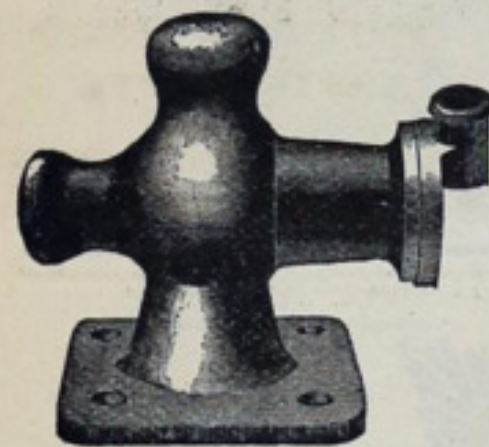
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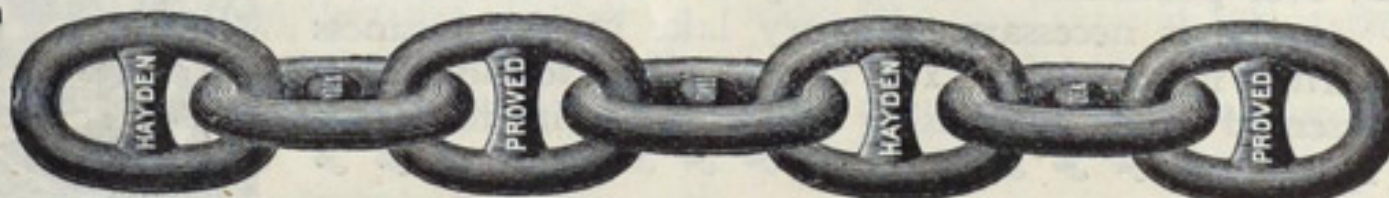
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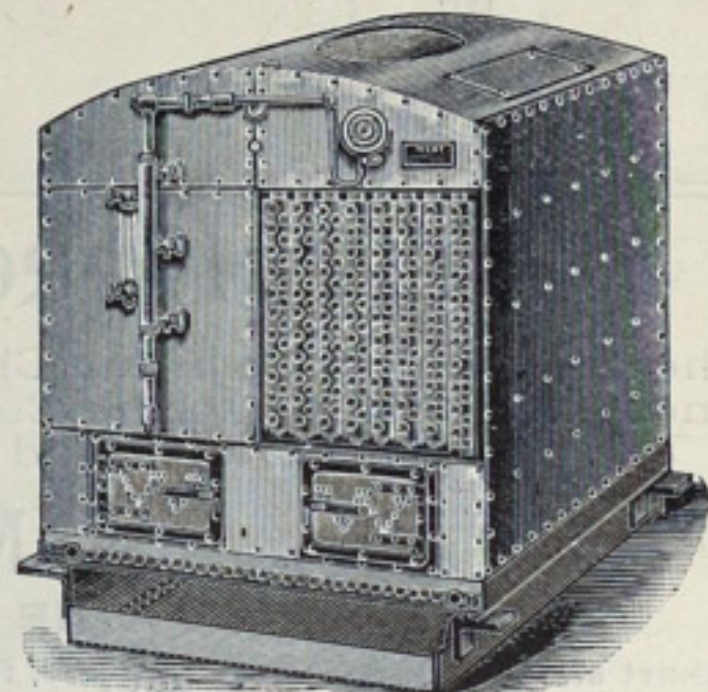
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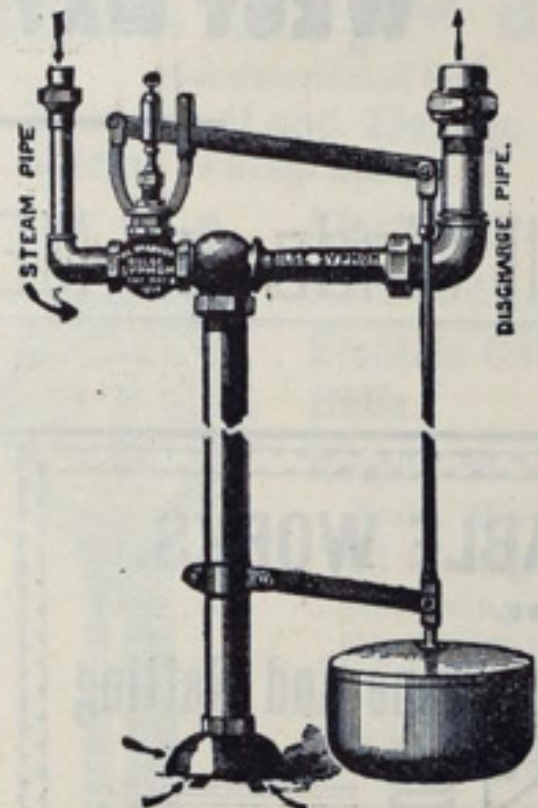
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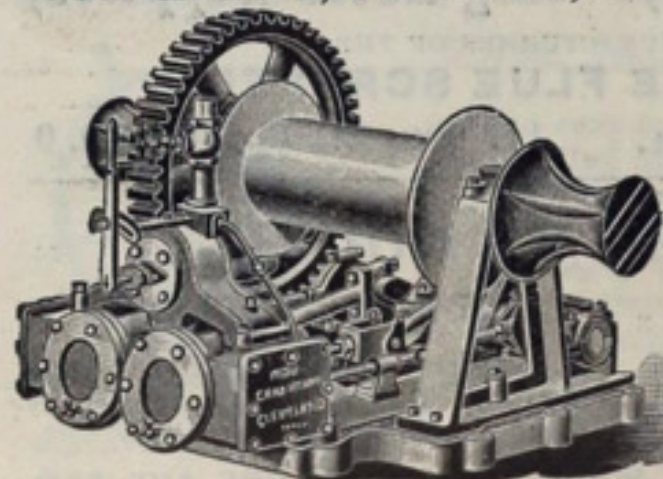
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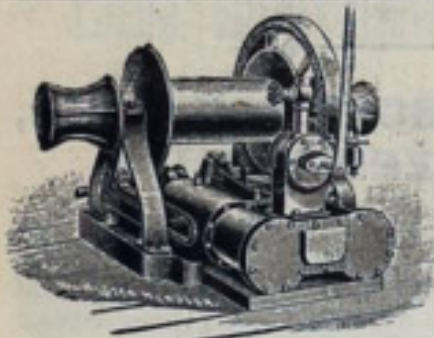
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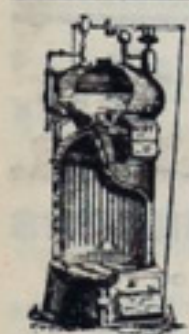
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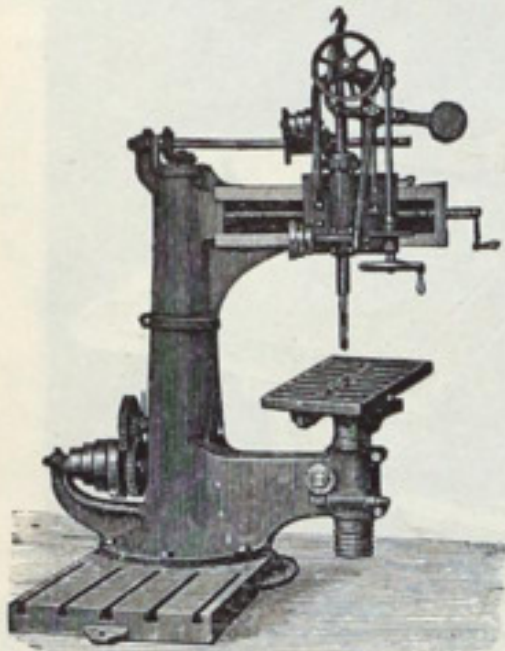
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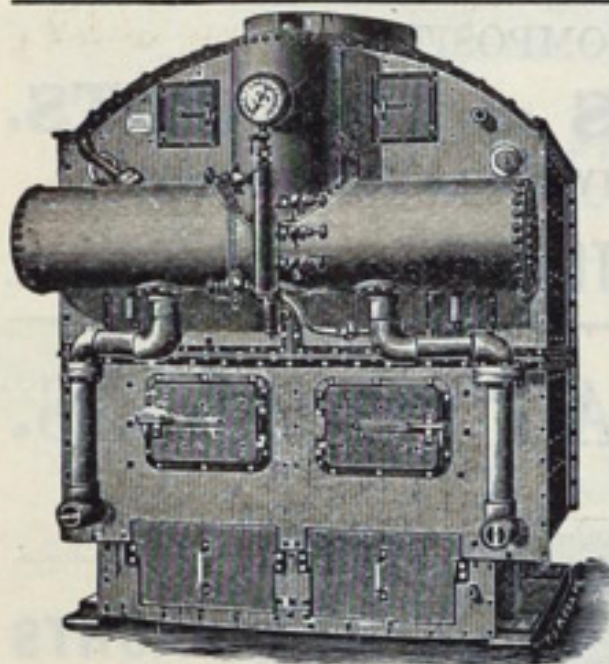
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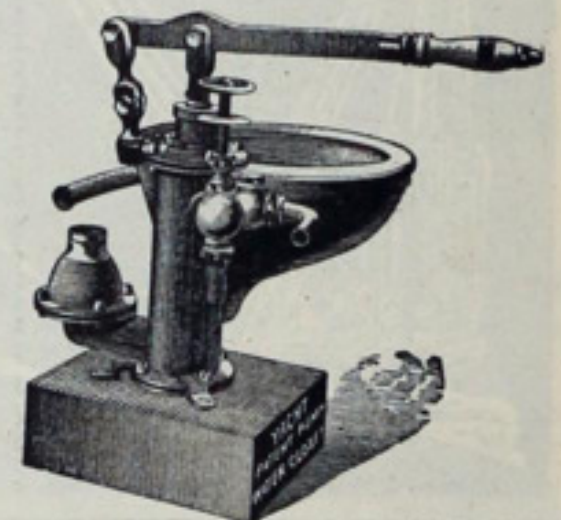


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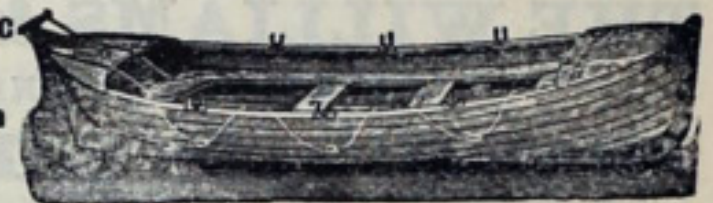
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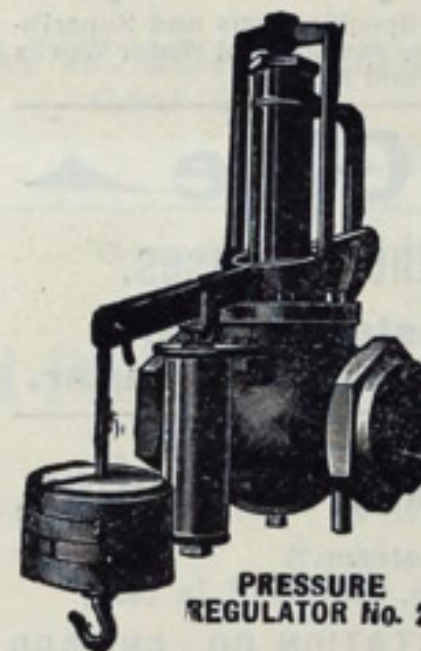
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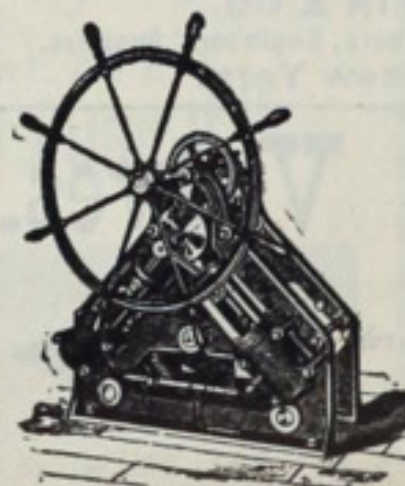
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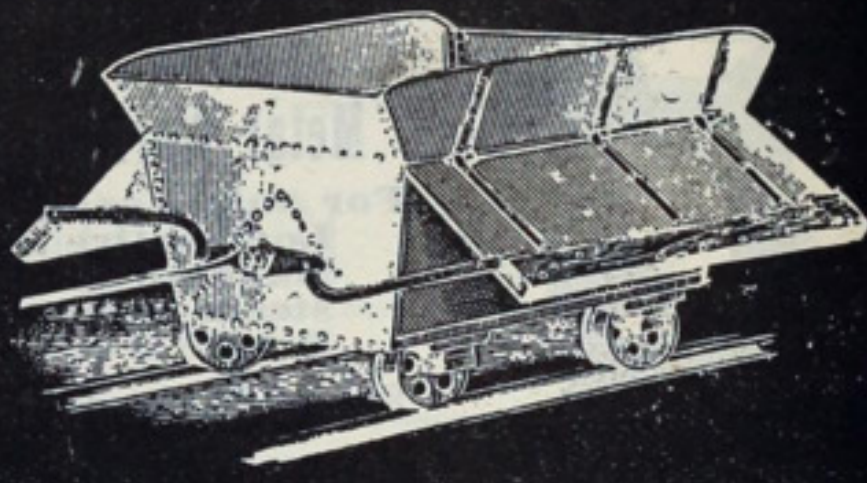
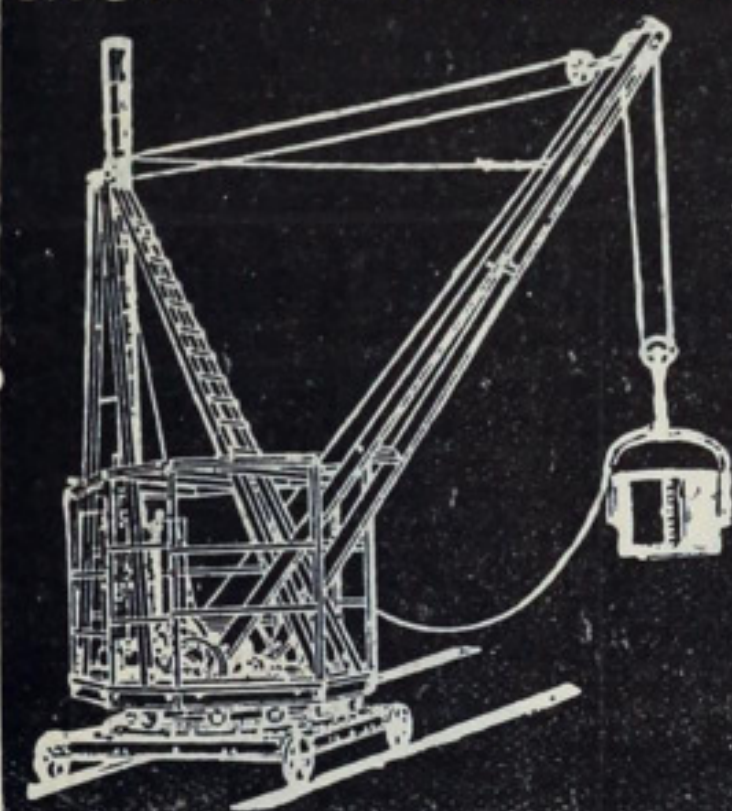
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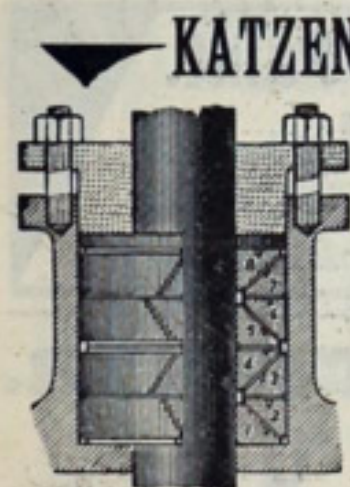
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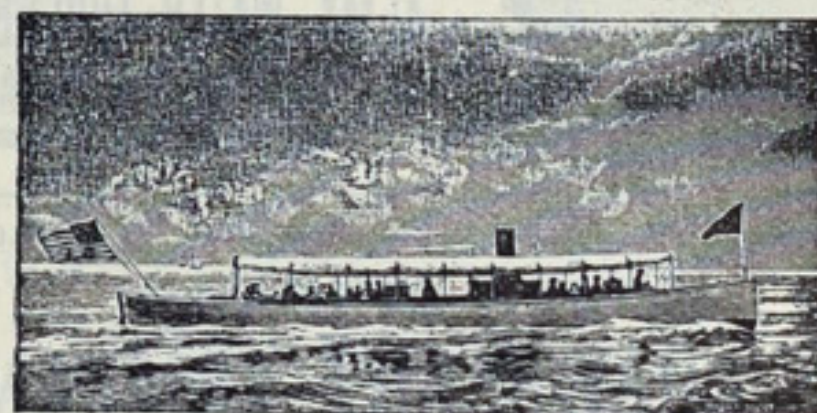
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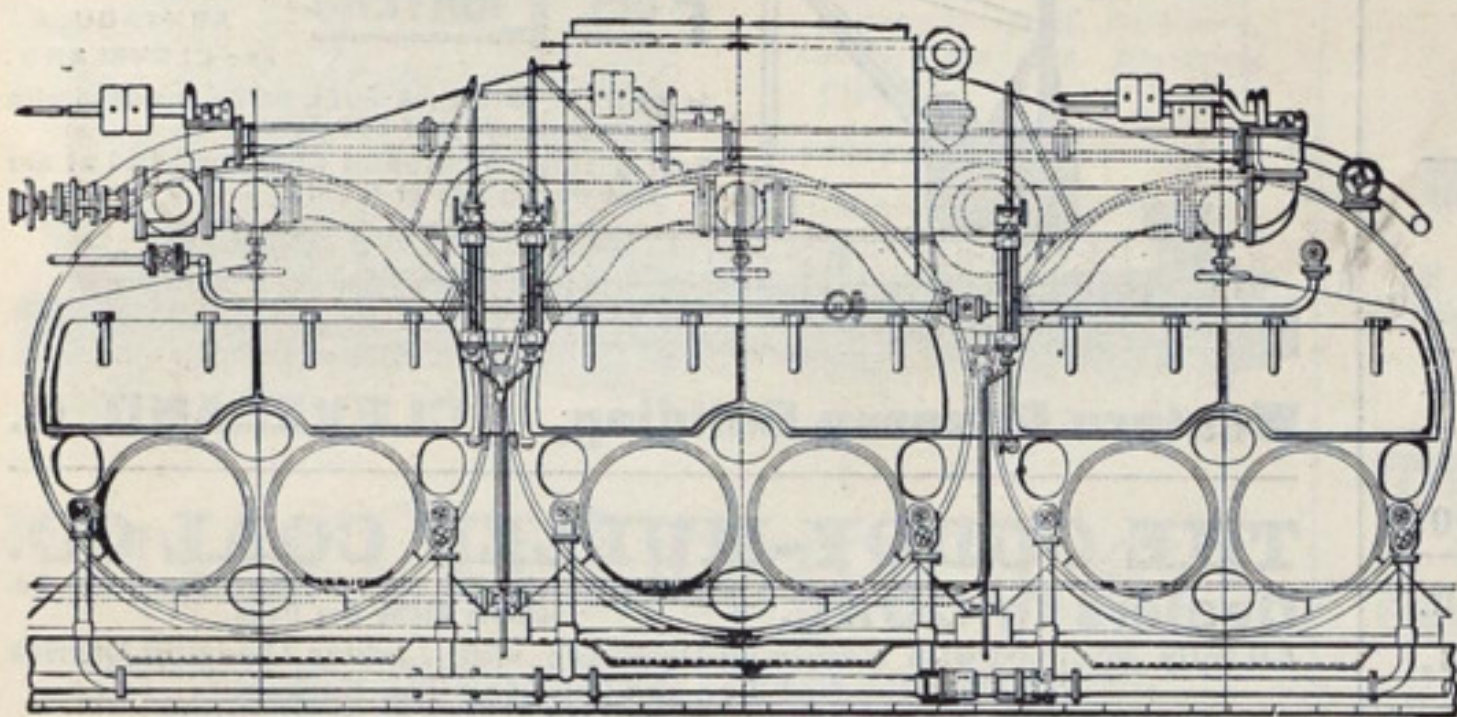
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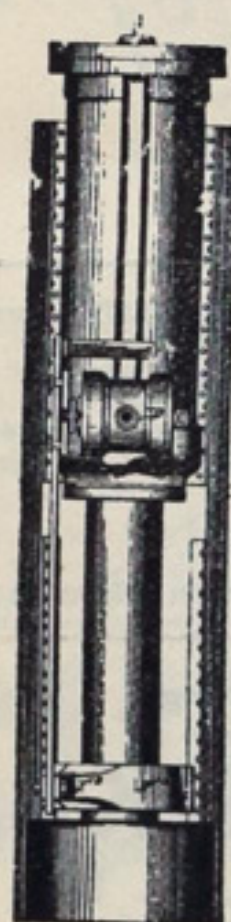
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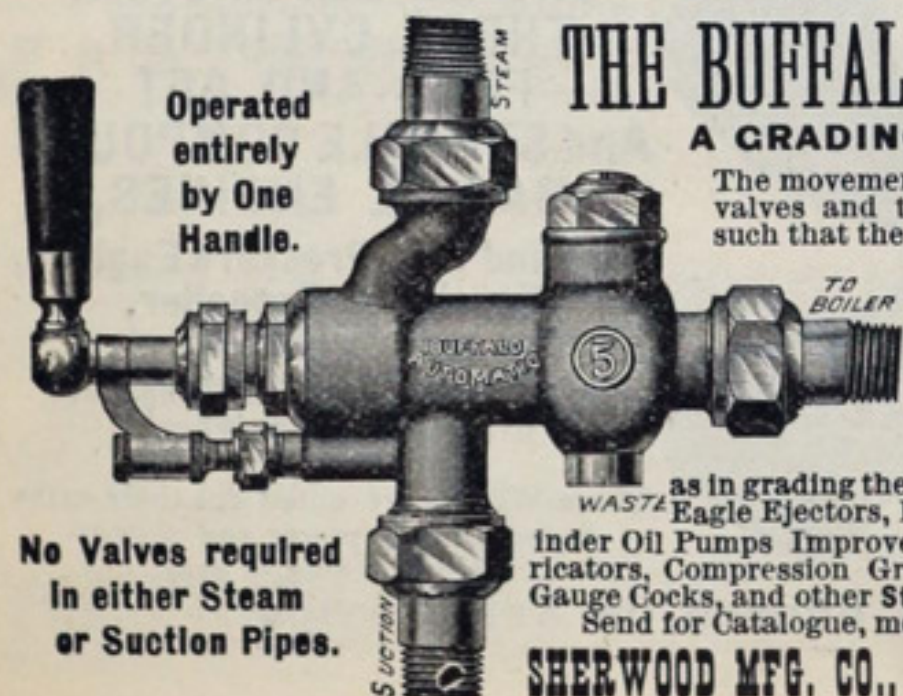
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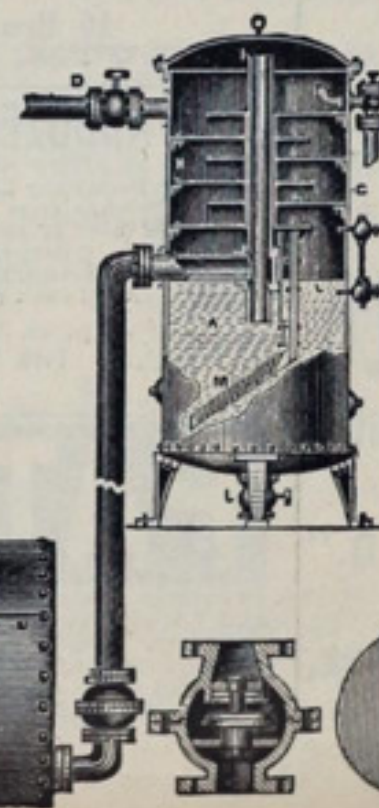
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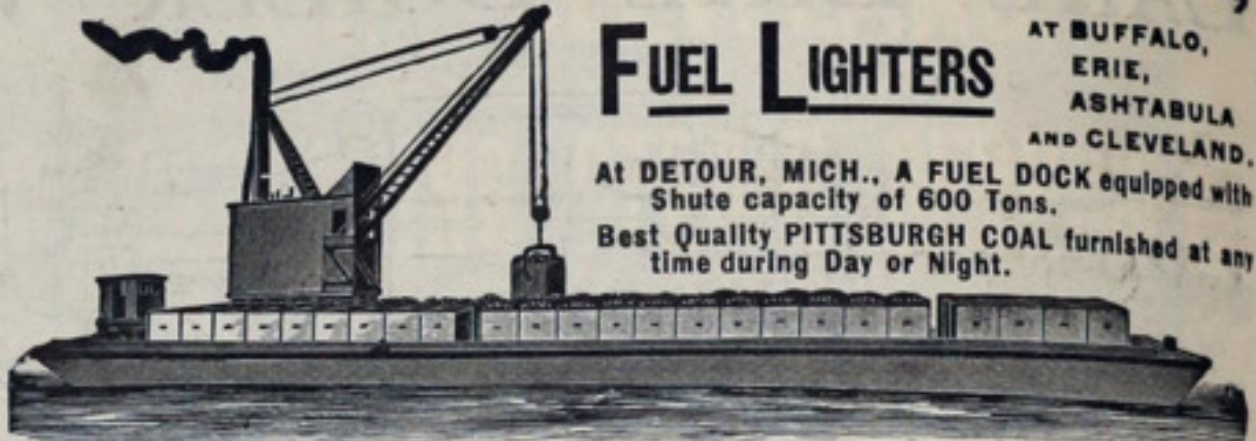
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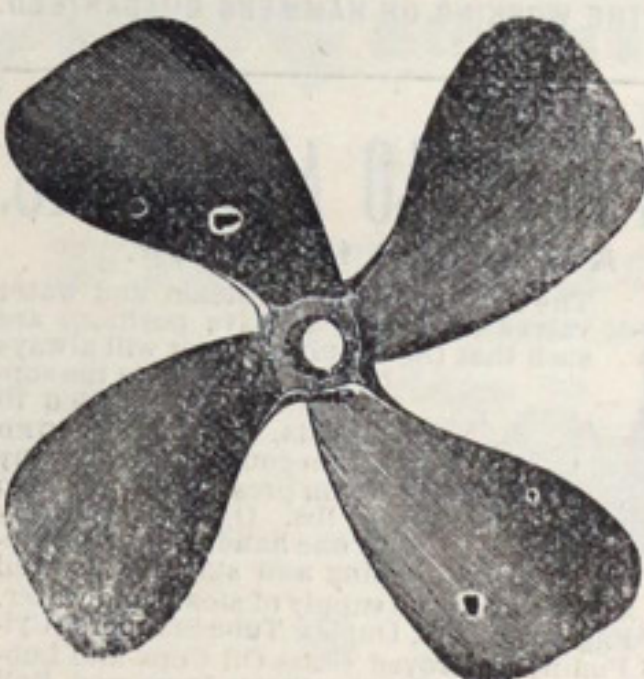
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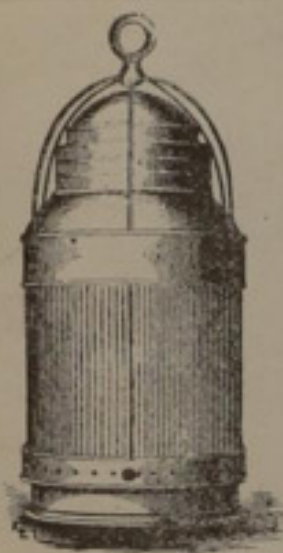
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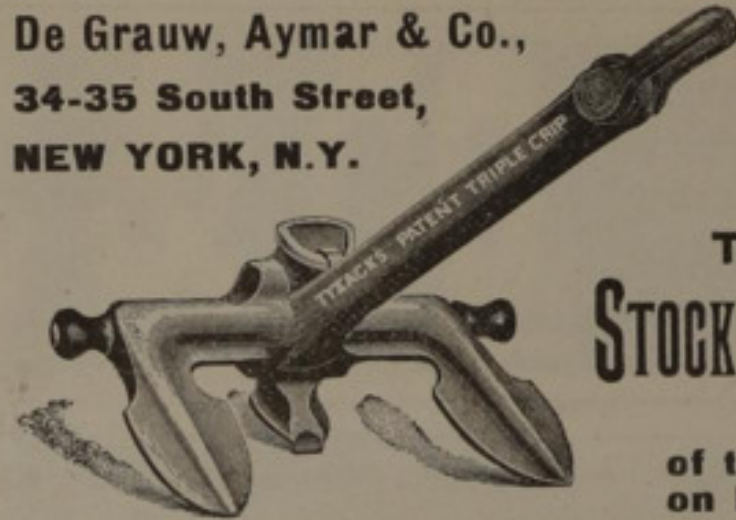
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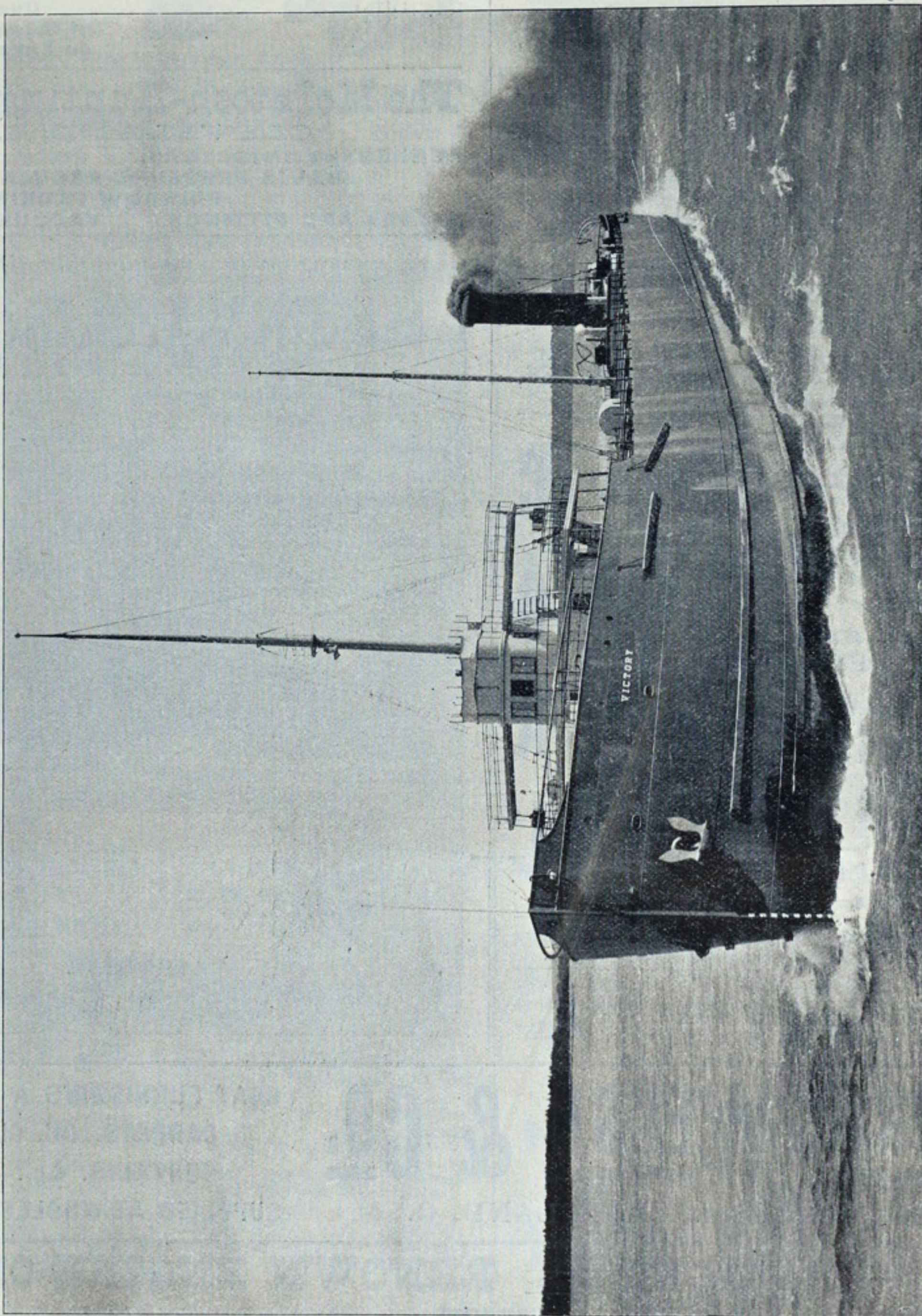
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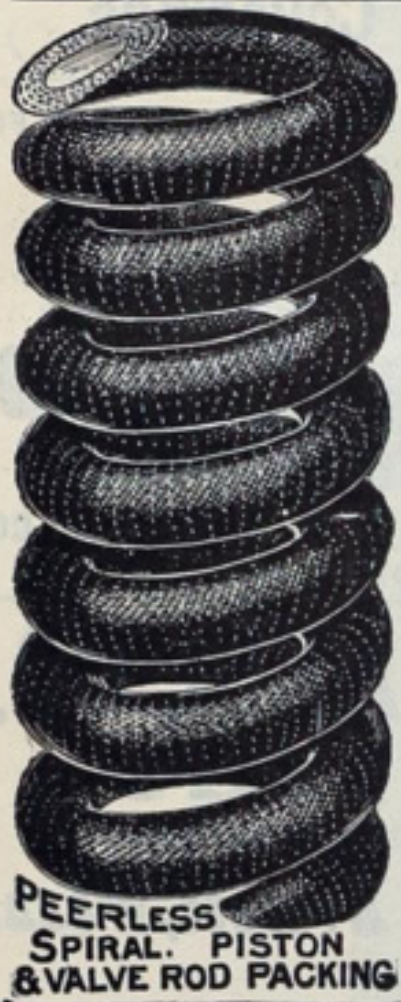
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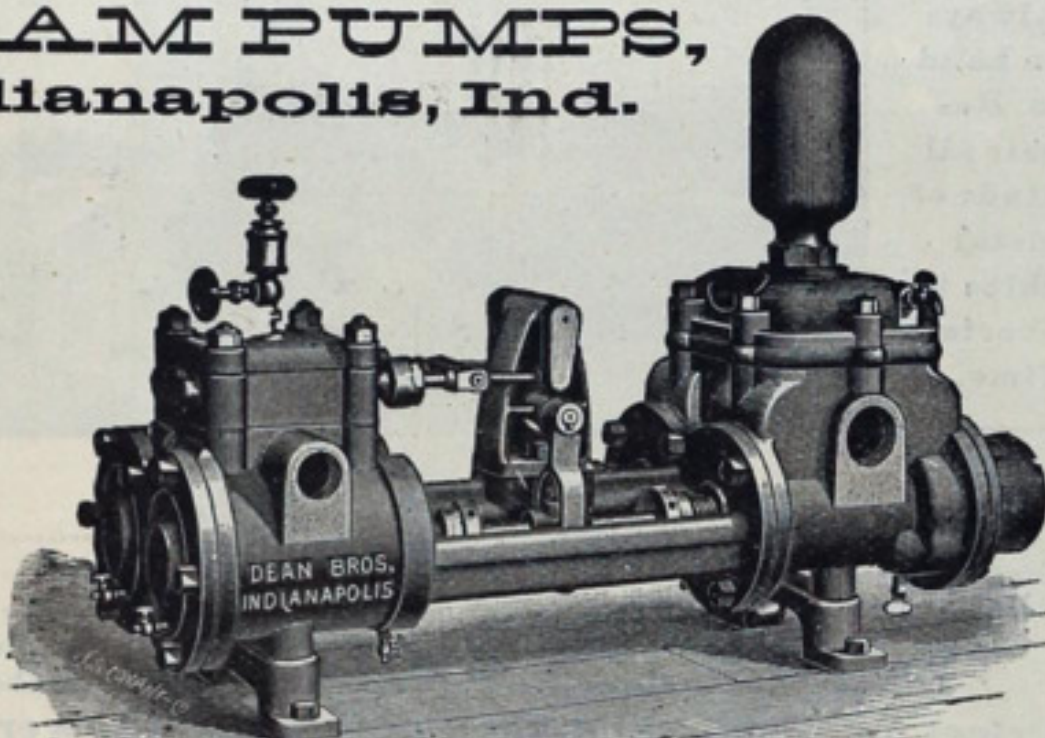
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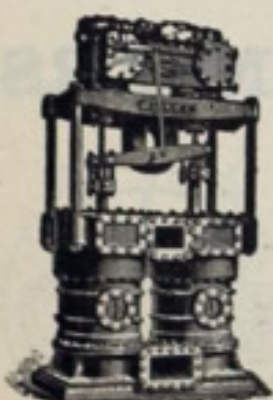
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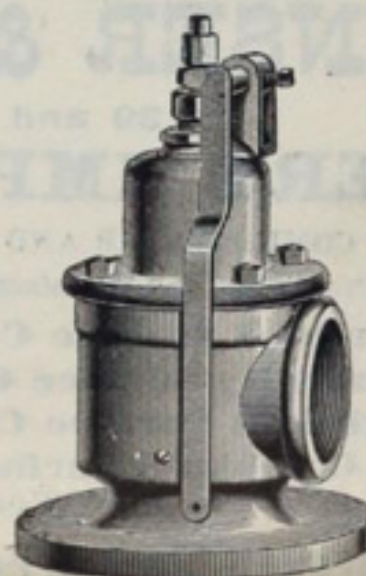
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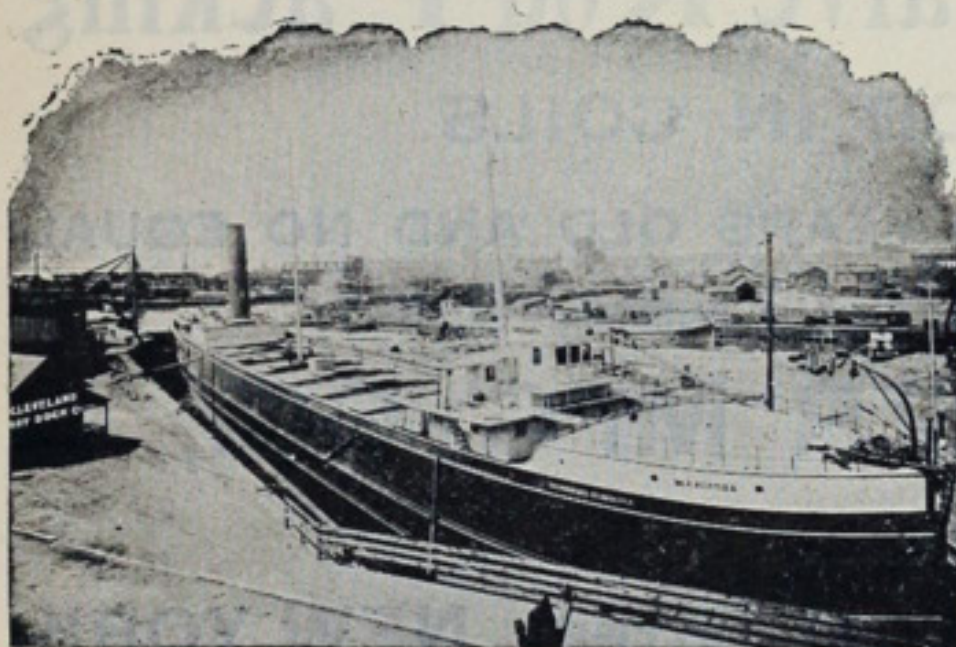
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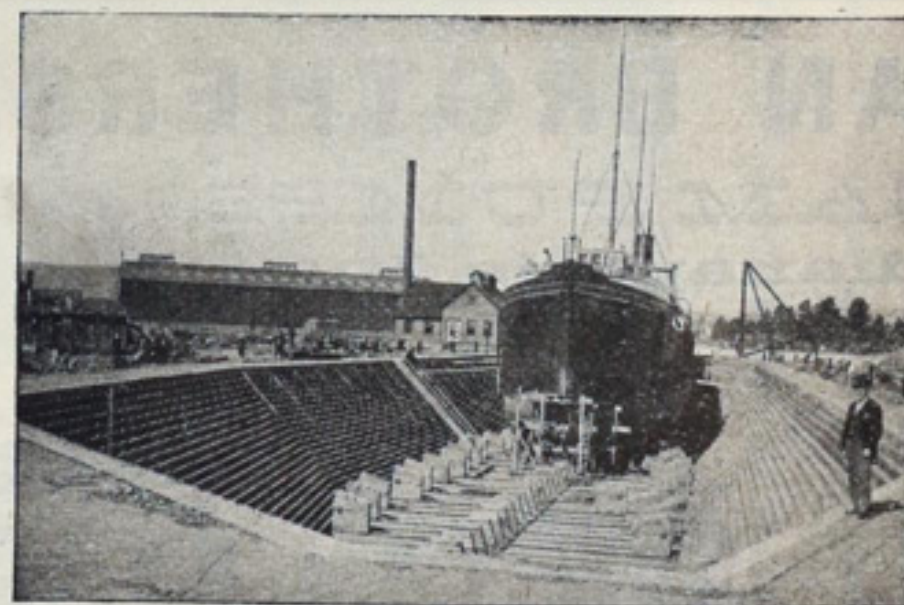
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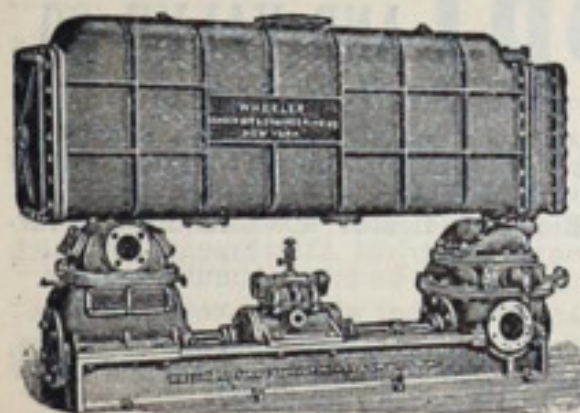
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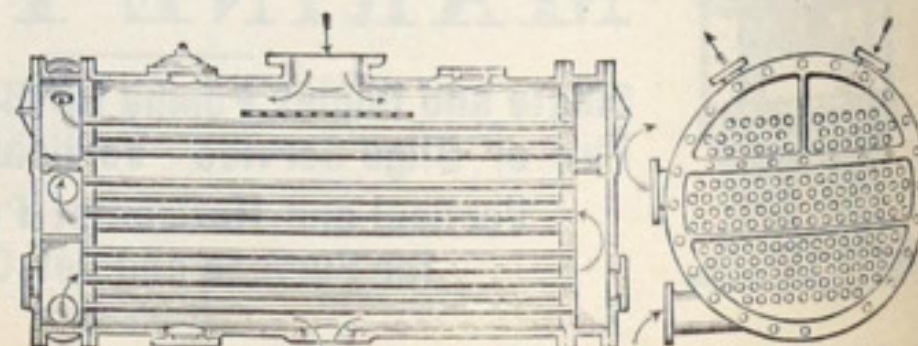
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